

TRIAL EXAMINER: You did?

THE WITNESS: Yes.

. . .

[15971] TRIAL EXAMINER: The hearing will be in order. I think we had better get straight on the rulings made on May 2 at transcript page 15799 to transcript page 15800 and 15833 and 15839.

Again at transcript 15799 parts of the prepared testimony that were stricken referred to the pagination of the prepared testimony before transcription by the reporter pursuant to the direction of the Examiner.

It should be stated that the rulings apply to the official transcript as follows:

The first ruling striking testimony applies to transcript 15746, line 18, continuing over to page 15747, line 4, both inclusive.

The second ruling applies to transcript page 15751, lines 10 to 24, both inclusive.

Next, transcript page 15758, beginning with line 9 and continuing over to 15759, line 1.

Next, to transcript 15774, the phrase "By design" in line 25.

The next applies to 15775, lines 8 to 11.

MR. GOLDBERG: Line 8 beginning with the word "but"?

TRIAL EXAMINER: Yes, but not including the word "the", and the phrase "concealed" at line 15.

Next, 15783, lines 14 and 15; next 15789, lines 2, 3 and [15972] 4, through the word "investment" and line 6, beginning with the phrase "in this connection" and continuing through line 11.

The ruling at transcript page 15833 strikes the testimony on page 15773, lines 2 to 11, inclusive, and the ruling at transcript page 15839 strikes the testi-

mony beginning with line 25 on page 15773 through line 14 on page 15774.

MR. GOLDBERG: Didn't that ruling strike out the answers appearing at lines 19 and 23 of page 15773?

TRIAL EXAMINER: No.

MR. SPARKS: May the record show that I renew my objection to Your Honor's rulings?

. . .

[15974]

J. RHOADS FOSTER

. . .

CROSS-EXAMINATION^d (Resumed).

By MR. GOLDBERG:

. . .

[15990] THE WITNESS: It does not appear. I have here a computation for each of the fourteen companies as at March 31, 1947 made in the manner which Mr. Joseph used for the purpose of page 38-A.

TRIAL EXAMINER: You have not put those in?

THE WITNESS: I have not put those in.

TRIAL EXAMINER: Do you have them available there and could you read them in the record?

THE WITNESS: If the Examiner desires, I would be glad to do so.

By MR. GOLDBERG:

Q. You say you are going to read into the record the March 30, 1947 earnings-price ratios? [15991] A. If the Examiner desires that I do so.

TRIAL EXAMINER: March 30, 1947?

THE WITNESS: March 31.

TRIAL EXAMINER: And this will be what the witness Joseph has called the "Earnings-Price Relation"?

THE WITNESS: As I understand the method used by Mr. Joseph.

By MR. GOLDBERG:

Q. These that you are going to read into the record are supposed to be determined on the same basis that Mr. Joseph determined his, or are these adjusted earnings-price ratios? **A.** No, as I just said, on the same basis that Mr. Joseph used as I understand their basis.

TRIAL EXAMINER: And your latest earnings, will they be in every case for December, 1946?

THE WITNESS: I believe so.

TRIAL EXAMINER: And if they are not, would you indicate it?

MR. SPARKS: It will be for the year 1946.

TRIAL EXAMINER: The calendar year 1946?

THE WITNESS: That is right, the year ended December 31, 1946.

Does the Examiner desire that I read the earnings per share and the ratio, or shall I also include the market price?

TRIAL EXAMINER: You may include all three.

THE WITNESS: For Bangor Hydro Electric Company, a market price of \$31; earnings per share of \$3.06 and a ratio of [15992] 9.87 per cent.

For Boston Edison Company, a market price of \$44, earnings per share of \$2.53, and a ratio of 5.75 per cent.

For Cleveland Electric Illuminating Company, a market price of 38¾, earnings per share of \$2.55, and a ratio of 6.58 per cent.

For Commonwealth Edison Company, a market price of 29¾, earnings per share of \$1.91 and a ratio of 6.42 per cent.

For Consolidated Edison Company of New York, a market price of 27¼, earnings per share of \$2.20 and a ratio of 8.07 per cent.

For Consolidated of Baltimore, a market price of 75 $\frac{3}{4}$, earnings per share of \$5.46 and a ratio of 7.21 per cent.

For Detroit Edison Company, a market price of 27.18, earnings per share of \$1.67, and a ratio of 6.16 per cent.

For Houston Light and Power Company, a market price of 87 $\frac{3}{4}$, earnings per share of \$5.48, and a ratio of 6.25 per cent.

For Idaho Power Company, a market price of \$35, earnings per share of \$2.74, and a ratio of 7.83 per cent.

For Indianapolis Power and Light Company, a market price of 26 $\frac{3}{4}$; earnings per share of \$3.23 and a ratio of 12.07 per cent.

For Pacific Gas and Electric Company, a market price of 39 $\frac{5}{8}$ ths, earnings per share of \$2.72 and a ratio of 6.86 [15993] per cent.

For Pennsylvania Water and Power Company, a market price of 63 $\frac{3}{8}$ ths; earnings per share of \$4.73, and a ratio of 7.46 per cent.

For Philadelphia Electric Company, a market price of 24 $\frac{3}{4}$; earnings per share of \$1.72 and a ratio of 6.95 per cent.

For Southern California Edison Company, a market price of 33 $\frac{1}{8}$, earnings per share of \$1.94, and a ratio of 5.86 per cent.

I have determined the simple average, Mr. Examiner. I have not determined a weighted average.

TRIAL EXAMINER: What is the simple average?

THE WITNESS: The simple average is 7.38 per cent.

[15996] Q. Now, without concerning ourselves with what Mr. Joseph did, the fact is that you are not in a position to tell us whether Bangor Hydro Electric Company or any of the other companies listed on page 38-A are companies of corresponding or comparable risks and uncertainties to Penn Water, is not that right? A. I have had no occasion to make studies for the purpose of establishing the

degree of comparability between the Penn Water equity investment and the others identified on page 38-A. I do know that there is substantial variation between those opportunities for investment with respect to character and quality of risk, that they are not comparable with each other, that probably some are comparable with Penn Water and some are not. I have had no occasion to make an explicit determination.

. . .

[16004] Q. Several years ago did you conclude that it was sufficiently comparable to New Jersey Power and Light Company to be used as a measure of determining the rate of return for New Jersey Power and Light Company?

A. The formula for a determination of the rate of equity return to New Jersey Power and Light Company, which is embodied in the so-called New Jersey plan which has a continuing application to New Jersey Power and Light Company, includes Boston Edison common stock as one among ten common stocks which are used for the purpose of establishing an average earnings-price ratio which averaged over a period of time and subjected to the addition of a multiplier fixes the annually determined return on equity capital for New Jersey Power and Light Company.

I would like to add in further answer to your question that that selection of Boston Edison among the ten was not based upon comparability with New Jersey Power and Light Company but upon considerations of representativeness of the market prices of the common stocks and the reliability of such evidences of investor appraisals and changing appraisals.

Q. The selection was based upon meeting the criteria in the Bluefield case including correspondence of risks and uncertainties; is not that so? A. That is an incorrect statement. I do not want to quibble, Mr. Goldberg.

[16005] The selection was not based upon the consideration that Boston Edison, among others, was comparable with

New Jersey Power and Light equity as an investment opportunity.

The formula provided for a multiplier which results in an upward adjustment of the average earnings-price ratios to recognize what we have believed to be a difference in investment quality and risk.

Q. The companies used in developing the rate adjustment plan for New Jersey Power and Light Company appear on page 10 of a report issued by the Board of Public Utility Commissioners for the State of New Jersey on the New Jersey rate adjustment plan; is not that so?

A. That is right.

Q. And you are familiar with this report, which is dated March 28, 1944, are you not? A. With the assistance of Major Flagg, I wrote the report.

Q. Yes, that saves me another question.

The ten companies are Boston Edison Company, Central Hudson Gas and Electric Company, Cleveland Electric Illuminating Company, Commonwealth Edison Company and subsidiaries, Connecticut Light and Power Company, Consolidated Edison Company and subsidiaries, Consolidated Gas Electric Light and Power Company of Baltimore, Detroit Edison Company, Philadelphia Electric Company and Pennsylvania Water and Power Company; is not that so? A. Yes, sir; . . .

[16008] Q. But I am asking you whether it is your statement that when the ten companies were used in developing this New Jersey rate adjustment plan, it was considered that they were not reasonably comparable to New Jersey Power and Light Company? A. I have answered that it was considered that they were sufficiently non-comparable that that non-comparability was recognized by a quantitative adjustment in the formula.

[16010] Q. Are you referring to the selection of the barometer group which heading appears on page 79? A.

The barometer group is a short identification of the ten companies.

Q. Now, with respect to those ten companies in the selection of the barometer group, this statement appears, "The rate of return (expressed as earnings, not dividends) expected by equity investors in other enterprises 'attended by corresponding risks and uncertainties' is the measure of the fair return to the equity investors in the Electric Department, but the problem is to find enterprises of this class for which representative market quotations are available."

— That statement appears there, does it not? A. It does. May I read it further?

Q. Yes, I am going to. This statement appears, does it not, "A total of only about thirty-five publicly owned common stocks are in the list from which the selections must be made. Since the function of the barometer group is to make available an index of the movement (not necessarily the level) of the cost of equity capital, the following criteria are of first importance in the selection: 1. The common stock should be traded in the market in sufficient volume and regularity that the established prices are representative of investor appraisals.

"2. The common stock should have been publicly owned [16011] for a sufficient time that knowledge of its income experience is generally available and it is 'seasoned'.

"The group of ten utility capital stocks has been selected primarily with reference to these criteria."

I have correctly read, have I not, from that report? A. Yes.

Q. And the group of 10 referred to are the ten companies we read into the record. Is not that right? A. Selected by reference to these criteria, and recognizing as was stated in a sentence which you read, that the level of cost of equity capital is not necessarily the same for the average of the group of 10 as it was for New Jersey Power and Light Company and since we conceded that it was not

the same, as I have explained, that difference was recognized and reflected in the formula by an adjustment factor.

Q. And one of the criteria you were attempting to meet in establishing the rate of return were the phrases in the Bluefield case we have heretofore referred to? A. We were attempting to meet that criteria by the adjustment which I have referred to which in our opinion would meet it but the average of investor appraisals for the group of ten, including Boston Edison, would not have done so.

Q. Now, with respect to comparability, this is stated on page 81, is it not, "Since the first criteria in selection of [16012] the barometer group are the considerations of representativeness, further attention must be given to means of obtaining comparability with New Jersey Power & Light Company." I have correctly read that, have I not? A. That is right.

Q. And it goes on to say, does it not: "A large measure of comparability is obtained by limitation of the group to electric or electric-gas combination companies"? A. That is right.

Q. And it says further, does it not, "Second, the ten include only utilities operating in the Northeast, since there are regional differences in the cost of capital." Is not that right? A. That is right.

Q. Stopping for a moment, all of those ten do not operate in the northeast; is not that so? Commonwealth Edison you would not say operates in the northeast? A. Well, it might have been a liberal definition of northeast.

Q. Detroit Edison Company is another one. Now, that certainly is being pretty liberal in saying that is in the northeast, is not that so?

MR. SPARKS: That depends on where you are.

By MR. GOLDBERG:

Q. Well, right where we are or were when we wrote that [16013] report in Jersey City? A. As one who came from Missouri, it is perhaps a handicap as a consequence.

Q. You would say that is a rather liberal use of the term to say that Detroit Edison operates in the northeast.

A. Not from the point of view of a Missourian.

Q. It states "Third, operating companies which are also functional holding companies are excluded." Is that right? A. That is right.

Q. Then it does go on to say what I think you have been insisting: (1) "The barometer group is generally comparable, but the average earnings-price ratio requires three adjustments before it may reasonably be used as the equity capital [16014] return rate." Is not that so? A. That is right.

Q. And am I correct in my understanding that these three adjustments were accomplished simultaneously by application of the appropriate "capital structure factor."

A. That is right. The word "Capital structure factor" should be in quotes as a name given to an adjustment factor which accomplished more than adjustment for the differences in capital structure.

Q. And you say it accomplished also consideration of the size of the company? A. Size of company was one of the characteristics which caused the risk quality of the average of the ten barometer stocks to vary from New Jersey Power and Light Company.

Q. Now, then, at page 72 the opinion is expressed, is it not, in that report, that the rate of return provisions of the New Jersey plan are consistent with the standard expressed by the Supreme Court in the Bluefield case? A. That is right.

Q. Now, then, at page 74 this appears, does it not, "The Electric Department of New Jersey Power & Light Company obviously has no security market experience available as direct evidence in establishing the historical cost of debt or preferred capital stock (although such experience is available on a Company basis) or the current cost of equity capital.

[16015] "Direct evidence of the current cost of equity capital is not available for the further reason that the company is a subsidiary of a holding company. Its common stock is not outstanding in the hands of the public and is not bought and sold so as to permit expression of investor appraisals of its value. Therefore, the equity capital component of the basic rate of return is determined by reference to earnings-price ratios representing returns 'on investments and other business undertakings which are attended by corresponding risks, and uncertainties.' (Bluefield Company v. Public Service Commission.)" That appears there, does it not? A. It does.

. . .

[16017] Q. Now, in connection with determining the basic rate of return for that plan in the paragraph numbered 12 at page 10 of the report, this appears, does it not?

"If the required information is not available for any of the above listed common stocks"—and that refers to the barometer group of stocks, does it not?

A. It does.

Q. —"at the time of determination of the basic rate of return for any test year, the number of such common stocks shall be maintained at ten by substituting, for such test year only, the common stocks of other electric or electric gas combination operating utilities. Such substitution shall be made in accordance with the following order of preference: (a) electric utilities with annual gross operating revenues of from five to fifty million dollars and located in the New England, Atlantic and East North Central States; (b) electric-gas combination utilities of the said size and located in the said areas; (c) electric utilities located anywhere within the United States, and (d) electric-gas combination utilities located anywhere within the

United States. When more than one utility is [16018] available in accordance with this order of preference, the utility with the largest annual operating revenue shall be substituted."

I have correctly read from that paragraph, have I not?
A. You have.

[16032] Q. Now, Dr. Foster, with respect to transcript page 15765 at the bottom of the page the last answer, are we to understand from that answer that the issues which are represented on page 40 of Exhibit 46 are too small to be significant with respect to conclusions on Penn Water?
A. The statement at lines 20 to 25 at the bottom of page 15765 refers to the instances listed on page 40 which represent offerings of common stock for the purposes of providing new capital.

Therefore the statement does not refer to all of the instances listed on that page but only those not excluded by use of footnote No. 1 on that page.

It was with reference to the 8 earnings-price ratios—

MR. SPARKS: Earnings-offering-price ratios?

THE WITNESS: Earnings-offering-price ratios representing net proceeds of not more than 21 million dollars that this [16033] statement was made.

By MR. GOLDBERG:

Q. In other words, the statement was addressed to the issues on page 40 that are not included in footnote 1. Is that it? Those that are not affected by footnote 1? For example, Boston Edison Company, West Penn Power Company and Louisville Gas and Electric Company, and so on?
A. The statement was so limited because of Mr. Joseph's testimony that for the purpose for which page 40 was offered, the other instances should have been excluded.

Q. You mean as you understood Mr. Joseph's testimony, the purpose for which page 40 of Exhibit 46 was included requires reference only to the issues that do not have the footnote 1 reference? A. Yes, the testimony to which I refer is that quoted at lines 12 to 16 of page 15764.

Q. What did you understand was the purpose for which page 40 had been offered? A. I understood that the purpose for which the page was offered was to provide evidence or an indication of the cost of equity capital to enterprises comparable with Penn Water.

Q. Now, then, you say that the group of eight to which the footnote 1 is not appended is insufficient in number and amounts, and their diversity of risk characteristics are too great to permit significant conclusions as to Penn Water; is [16034] that right? A. That is right.

Q. Now, then, do I understand from your testimony that for the purposes for which you understood page 40 of Exhibit 46 was offered, it is appropriate to include the issues which have footnote 1 appended?

. . .

THE WITNESS: I will be compelled to give you a qualified answer to that question.

In recognition of the capitalization rate associated with the sale of common stock already outstanding, it requires that consideration be given to the difference in circumstances between the sale of such common stock and the offering of common stock for the purpose of providing new capital.

. . .

[16040] Q. In other words, your objection did not so much run to the number of instances and their amounts, and even their diversity of risk characteristics, but to the fact that there had been no showing on page 40 of Exhibit 46 which would enable one to give consideration to this diversity of

risk characteristics and the effect of the size of the issue in arriving at significant conclusions; is that right? A. I believe you are saying, that since there is that [16040-A] diversity of risk characteristics, there has been no showing upon the basis of which it would be possible to reach a conclusion as to which one, if any, is comparable with the Perm Water common stock.

Q. That is what I understand you are saying. Is that right? A. Yes.

[16042] Q. Now, you appeared as a witness for the Consolidated Edison Company before the New York Public Service Commission on January 17, 1947; is not that right?

A. As of approximately that date. I am not sure as to the exact date.

[16050] TRIAL EXAMINER: Where in Exhibit 46 have you criticized any tabulations for not showing adjustments where those [16051] tabulations relate to other than spot earnings-price ratios?

You began by instancing page 38-A, and you decided there you had spot ratios only.

THE WITNESS: The criticism was directed specifically to page 38-A.

TRIAL EXAMINER: What other page?

THE WITNESS: The cross-examination yesterday however brought out the application of that criticism to page 38, the preceding page.

[16053] Q. It is a fact, is it not, Dr. Foster, that in your exhibit in the New York case, schedule 3 of that exhibit, you did not adjust the earnings-price ratios for the period 1942 to 1946, inclusive? A. What do you mean by "adjustment of earnings-price ratios"?

Q. You did not adjust the earnings.

THE WITNESSES: The method used in the preparation of the schedule to which you refer in the exhibit of which it was a part was the same as that which has been described here.

So far as the adjustments, the statements of earnings-price ratios are concerned, I believe it is correct that the work had already been done, and as presented there, was the same as had been presented here.

With more specific reference to your question, the adjustment for the year 1944 was one, which was for reduction of Federal income taxes by extraordinary deductions charged to surplus, for the purpose of stating adjusted gross income.

With respect to the statement of income deductions, there [16054] was a corresponding adjustment for charges equivalent to the reduction in Federal income taxes in the amount of \$2,100,000.

For the year 1945, in the analysis of gross income there was an adjustment in the amount of \$6,270,000 representing a reduction of Federal income taxes by extraordinary deductions charged to surplus.

Also in that year there was an adjustment of the income deductions in a corresponding amount.

For the 12 months ended Sept. 30, 1946 there was an adjustment of the same character, and for the same purpose, in the amount of \$5,120,000.

Q. Is it not a fact, Dr. Foster, that on Schedule 3, columns 12 and 13 of Exhibit 126 in the New York case, your earnings-price ratios are based upon earnings as reported by the companies? **A.** The earnings-price ratios are based upon the earnings per share as shown by Schedule 3. There was no acceptance of earnings as reported because they were reported. The adjustments which I have described are reflected on Schedule 3, and it happens that they are adjustments which affect the amount of gross income and the income deductions rather than the net income.

Q. Now, does your answer mean that on schedule

3 of Exhibit 126, columns 12 and 13 for the period 1942 to 1946, that the earnings employed were the earnings as reported by [16055] the Consolidated Edison Company?

A. It means that the period which you have identified the earnings employed for the purpose of the construction of the earnings-price ratios after consideration of pertinent circumstances would be earnings represented by equity income as reported.

Q. In connection with your appearance before the New York Public Service Commission, when you presented Exhibit 126 there was included in that exhibit, schedule 16, which bears this title, "Electric and Electric Combination Utility Common Stocks offered to the Public (a) During the period January, 1939 to November, 1946, inclusive, with Earnings Offering Price Ratios"; is not that right?

A. Yes.

Q. And you have, I think as you have already stated included among the issues shown in that schedule 16, 20 of the 22 issues shown on page 40 of Exhibit 46. I think you can accept my statement for that, because I have checked it.

[16057] Q. With the exception of the Boston Edison Company issue on page 40 of Exhibit 46, all of the issues shown on that page are reflected in your schedule 16 to Exhibit 126 in the New York case? A. I believe that is a correct statement.

Q. Now, then, your schedule 16, all of the column shown on schedule 16 with the exception of column 14 correspond with the columns shown on page 40 of Exhibit 46; is not that so? A. You mean as to the general character of the data?

Q. Right. A. —being set out?

Q. Right. A. I believe that is correct.

[16072]

REDIRECT EXAMINATION

By MR. SPARKS:

Q. Page 15891 of the transcript, lines 16 to 22, you were asked by the Examiner whether you have done anything toward bringing the earnings-price ratios for the six common stocks up to date since your last appearance on the stand. You answered that you have not brought the earnings-price ratios to a recent date, and that to do so, would contribute little or nothing to the conclusion.

Please explain why in your opinion more recent price ratios would contribute little or nothing to the conclusion:

A. Exhibit 167 provides for the months September, 1944 to December, 1945, inclusive earnings-price ratios for the Penn Water common stock, and averages for the six other common stocks in which are reflected data becoming available after the preparation of Exhibit 29.

The earnings-price ratios representing the six common stocks have increased steadily and sharply since November, 1945. These earnings-price ratios are not adjusted for the effect of the [16073] revision of the Federal income tax rates, or other influences which caused the end of the downward movement and the beginning of the upward movement of the earnings-price ratios.

The upward movement is continuing. One cycle of earnings-price ratio movement ended in November, 1945, and a new cycle is under way.

No indication is now available to the length of the new cycle or as to the earnings-price ratio levels which will be established under such a new cycle. Therefore the earnings-price ratios established in most recent months would not modify the conclusion as to the cost of equity capital to Penn Water.

Q. At page 15994 of the transcript the Examiner and you referred to summarized earnings-price ratios for 80 electric utility common stocks determined by relating reported earnings per share for the year 1946 without adjustments to market prices or quotations as of March 31, 1947.

Do you have a statement which shows the number of these earnings-price ratios within each 1 per cent interval in the range from 4 per cent to 17 per cent? A. Yes.

Q. Does the 80 include the earnings-price ratios for the 14 common stocks identified on page 38-A of Exhibit 46? A. It does.

Q. Is the distribution of the 14 earnings-price ratios [16074] shown separately? A. It is.

MR. SPARKS: Mr. Examiner, I have the tabulation which has just been referred to by Dr. Foster, and I ask that it be copied into the record at this point.

MR. GOLDBERG: May we see that before that is done?

MR. SPARKS: Yes.

MR. GOLDBERG: Are you going to have the whole thing copied into the record?

MR. SPARKS: Yes, we planned to have the whole memorandum copied.

TRIAL EXAMINER: The ~~reporter~~ may copy in the record at this point the tabulation referred to.

(The tabulation referred to is as follows:)

Earnings—Price Ratios for 80 Electric Utility Common Stocks* Distributed by Percentage Intervals.

Based on Earnings for 1946 (as reported) and March 31, 1947 Prices.

| Earnings-Price Ratio Range | Distribution of 80 | Distribution of 14 Identified on P. 38(a) |
|----------------------------|--------------------|---|
| 4.00-4.99 | 1 | — |
| 5.00-5.99 | 8 | 2 |
| 6.00-6.99 | 13 | 6 |
| 7.00-7.99 | 8 | 3 |
| 8.00-8.99 | 11 | 1 |

*All electric utility common stocks for which market prices are reported in the Bank and Quotation Record dated April 7, 1947 and for which per share earnings were available.

| [16075] Earnings-Price Ratio Range | Distribution of 80 | Distribution of 14 Identified on P. 38(a) |
|---------------------------------------|-----------------------|---|
| 9.00- 9.99 | 11 | 1 |
| 10.00-10.99 | 14 | — |
| 11.00-11.99 | 2 | — |
| 12.00-12.99 | 3 | 1 |
| 13.00-13.99 | 5 | — |
| 14.00-14.99 | 2 | — |
| 15.00-15.99 | — | — |
| 16.00-16.99 | 2 | — |

By MR. SPARKS:

Q. What is the significance of this distribution of the 80 earnings-price ratios, Doctor? A. First, it indicates the approximate number of electric utility common stocks available at that date for a study of investor appraisals.

Second, it indicates that wide differences exist among the common stocks with respect to the risk characteristics of these opportunities for investment, and with respect to investor-appraisals of such risks, the variation is from 4.97 per cent which is the earnings-price ratio for the Hartford Electric [16076] Light Common stock to 16.8 per cent for the Puget Sound Power and Light Company common stock, and 16.1 per cent for the Illinois Power Company common stock.

Third, a group of fourteen common stocks selected from among the 80 common stocks by application of the criteria of superior marketability and availability of prices could not be expected to be comparable with the Penn Water common stock.

The average for the group of 80 common stocks is 9.17 per cent.

MR. GOLDBERG: Is that a simple arithmetic average?

THE WITNESS: That is a simple arithmetic average. Only two of the fourteen are above this average. The two

are relatively small companies which, on the basis of the earnings shown by page 38-A, would have a weight of about 1.5 per cent in a weighted average.

By MR. SPARKS:

Q. At page 16018 of the transcript, Mr. Goldberg asked whether the rate of return ascertained under the New Jersey plan is applied to a rate base which fluctuates with changes in price levels. You replied that it is not. Will you please outline the circumstances which differentiate the results which follow from the operation of the New Jersey plan from those which would follow from applying a current cost of capital rate of return to an original cost rate base.

A. First, the rate of return provided by the New Jersey [16077] plan is applied to the prudent investment and not an original cost rate base.

Second, the basic rate of return provided by the New Jersey plan includes full recognition of the prudent actual cost of capital represented by debt, and preferred stock capital.

Third, the effect of the adoption of prudent investment as the rate base under the New Jersey plan is influenced by availability to the company of returns in excess of the basic return.

The fair return available to the company is the basic return resulting from application of the basic rate of return to the rate base, plus such amounts of additional return as may be available for corporate purposes under the provisions affecting the stabilizing reserve and adjustments of charges for service.

Fourth, the stabilizing reserve and other provisions of the plan provide a stability of return to the common stockholders which otherwise would not be available.

The gain in certainty of return tends to compensate for what would otherwise tend to be an inadequacy of return under conditions of rising price levels.

Fifth, the formula for determination of the basic rate of return reflects in the basic rate of return earnings-price ratios averaged over a period of years, and avoids the inequities likely to result from use of spot earnings-price ratios.

Q. Doctor, at page 16058 of the transcript, Mr. Gold- [16078] berg questioned you with reference to Schedule 16 of Exhibit 126 which you submitted in the Consolidated Edison proceeding before the New York Commission.

MR. GOLDBERG: That is what transcript page?

MR. SPARKS: 16058.

By MR. SPARKS:

Q. Did you use the data contained in Schedule 16 of that exhibit in reaching a conclusion as to the representative capitalization rate for the Consolidated Edison common stock?

A. No, the capitalization rate for Consolidated Edison was estimated by analysis of investor's appraisals of the Consolidated Edison common stock over a period of years.

The data appearing on schedule 16 were used in the preparation of charts 9 and 10 in that exhibit, having to do with cost of financing.

The purpose of schedule 16 was to make available these cost of financing data.

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[16081]

RECROSS EXAMINATION

By MR. GOLDBERG:

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[16087] Q. We may be able to shorten this, then: Yesterday you read into the record the earnings-price ratios set forth on page 38-A of exhibit 46, using market prices at March 31, 1947 earnings as reported for 1946, and gave us the earnings-price ratios as well as the market price. Do you recall that? A. I do.

Q. Well, these earnings-price ratios that you read in yesterday have been distributed on this tabulation that was read into the record this morning? A. Yes; they are the same earnings-price ratios.

Q. Can you name the eight companies in the group of 80 whose earnings-price ratios fell within the 5 to 5.99 per cent, and before you do that, am I correct in my understanding that of that eight, two of them are part of the fourteen, namely, Boston Edison and Southern California Edison?

MR. SPARKS: Three, I think.

THE WITNESS: Two; you are correct.

By MR. GOLDBERG:

Q. So that the 80 really consist of an additional 66 [16088] companies; is that right, considering that we have already got fourteen. A. Perhaps I should say that the calculation or procedure was the other way around. I made the calculations for all that I could find, which of course, included the fourteen.

Q. In other words, the column showing distribution of the 80 includes the 14 that are under the column "Distribution of fourteen identified on page 38-A"; is that right? A. That is correct.

Q. Now, then, will you identify the additional six companies as having earnings-price ratios between 5 and 5.99 per cent? A. I will. Concord Electric Company, 5.40 per cent; Connecticut Power Company, 5.96 per cent.

New Bedford Gas and Electric Light Company, 5.99 per cent.

Central Hudson Gas and Electric Company, 5.90 per cent.

San Diego Gas and Electric Company, 5.58 per cent.

United Illuminating Company, 5.28 per cent.

Q. Now, will you give us the seven additional companies in the distribution of the eighty whose earnings-price ratios fall within the range of six to six point ninety-

nine per cent? A. The majority of these at low range are small New England electric companies; there is a geographical element there.

Answering your question concerning the seven additional common stocks in the range from 6.0 to 6.99 per cent, they [16089] are as follows:

Dallas Power and Light Company, 6.21 per cent.

Lynn Gas and Electric Company, 6.69 per cent.

Malden Electric Company, 6.59 per cent.

Central Maine Power, 6.78 per cent.

Cincinnati Gas and Electric Company, 6.79 per cent.

Connecticut Light and Power Company, 6.74 per cent.

West Pennsylvania Power Company, 6.07 per cent.

Q. Now, will you give me the companies and the earnings-price ratios for the additional five within the range from 7 to 7.99 per cent? A. Duke Power Company, 7.84 per cent.

Haverhill Electric Company, 7.29 per cent.

Consumers Power Company, 7.81 per cent.

Scranton Electric Company, 7.33 per cent.

Sierra Pacific Power Company, 7.73 per cent.

Q. Now, then, will you identify the ten additional companies falling in the range from 8 to 8.99 and give us the earnings-price ratios? A. California Electric Power Company, 8.11 per cent.

Newport Electric Corporation, 8.98 per cent.

Central Arizona Light and Power Company, 8.51 per cent.

Central Ohio Light and Power Company, 8.62 per cent.

Dayton Power and Light Company, 8.19 per cent.

Delaware Power and Light Company, 8.67 per cent.

[16090] Ohio Edison Company, 8.43 per cent.

Sioux City Gas and Electric Company, 8.44 per cent.

Tampa Electric Company, 8.53 per cent.

I have come out with nine instead of ten. I have overlooked one. If you would like me to find it I will do so.

Q. Let us pass it for the moment and go to the fourteen which range from 10 to 10.99. A. As I came out with 9, if I have a correct tally—

Q. I got 9, too.

MR. SPARKS: I have nine, also

TRIAL EXAMINER: Nine for the 9 to 9.99?

MR. GOLDBERG: Yes, 9 in the 9 to 9.99.

By MR. GOLDBERG: °

Q. It should be 10 based on the distribution you show?

A. The distribution that I have been referring to is that within the range of 8 to 8.99 per cent.

Q. I am sorry. I skipped one. The last group you read was the range of 8 to 8.99 and we should have had 10, but so far we have only got 9. Apparently one has been overlooked. The next range is 9 to 9.99, which is again 10.

A. Correct.

MR. SPARKS: I understand you are asking for fourteen, right?

MR. GOLDBERG: No, I had missed the fact that I had not gotten the 9 to 9.99.

[16091] THE WITNESS: Arizona Edison Company, 9.69 per cent; El Paso Electric Company, 9.00.

Holyoke Water Power Company, 9.32.

Iowa Southern Utilities Company, 9.81.

Carolina Power and Light Company, 9.65.

Central Vermont Public Service Company, 9.24.

Columbus and Southern Ohio Electric Company, 9.86.

Florida Power Company, 9.86.

Public Service of Indiana, 9.36.

Again I come out one short. It will show up somewhere because the totals check.

By MR. GOLDBERG:

Q. Let us go to the fourteen in the range from 10 per cent to 10.99 per cent. A. Black Hills Power and Light Company, 10.58 per cent.

Community Public Service Company, 10.60 per cent.
Frontier Power Company, 10.59 per cent.
Mountain States Power Company, 10.50 per cent.
Northwestern Public Service Company, 10.83 per cent.
Oklahoma Gas and Electric Company, 10.09 per cent.
Southwestern Electric Service Company, 10.10 per cent.

Virginia Electric and Power Company, 10.94 per cent.

Western Light and Telephone Company, 10.55 per cent.

It may be observed that some of these are not strictly electric utilities although I believe that they are in major part [16092] electric.

Central Illinois Electric and Gas Company, 10.08 per cent.

Northern Indiana Public Service Company, 10.50 per cent.

Southern Carolina Electric and Gas Company, 10.85 per cent.

Southwestern Public Service Company, 10.61 per cent.

Utah Power and Light Company, 10.09 per cent.

I do check fourteen this time.

Q. Will you give us the companies in the range from 11 per cent to 11.99? A. Southern Colorado Power Company, 11.81 per cent.

Iowa Public Service Company, 11.68 per cent.

Q. Now, there are two additional companies in the 12 to 12.99 per cent in addition to the one included in the fourteen. Will you give us those? A. They are Missouri Public Service Corporation, 12.27 per cent, and Tucson Gas Electric Light and Power Company, 12.96 per cent.

Q. Now, will you give us the five companies in the range 13 to 13.99? A. Missouri Utility Company, 13.95 per cent.

Tidewater Power Company, 13.53 per cent.

Birmingham Electric Co., 13.71 per cent.

Empire District Elec. Co., 13.61 per cent.

Public Service Co. of Colo. 13.92 per cent.

Q. Now how about the two companies within the range 14 to [16093] 14.99 per cent? A. The Arkansas-Missouri Power Co., 14.81%.

Lake Superior District Power Co. 14.09%.

Q. And you already have identified the two in the 16 to 16.99 per cent so we need not go into those? A. That is right.

. . .

[16106] EDWARD S. LOANE

was called as a witness and, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By MR. SPARKS:

Q. What is your full name, Mr. Loane? A. Edward S. Loane.

Q. What is your present position? A. I am assistant to the vice president of Pennsylvania Water & Power Company.

. . .

[16109] Q. Will you outline briefly your education and experience? A. I studied civil engineering at The Johns Hopkins University, School of Engineering, and received the degree of Bachelor of Engineering in 1928.

I stayed at the University for one year as a graduate student in mathematics, during which time I was also an instructor.

During two summers while I was at the Hopkins, I was employed by Penn Water, one summer in Baltimore and one in Holtwood.

For a little less than a year in 1929 and 1930, I was employed by a consulting engineer then engaged in bridge [16110] design.

Since March, 1930, I have been employed by Penn Water.

I am a Registered Professional Engineer in Maryland, an Associate Member of the American Society of Civil Engineers, and for a number of years have been a member of the Hydraulic Power Committee of the Edison Electric Institute.

Q. What have been your duties since you were employed by Penn Water in 1930? A. I have been a member of the staff of the administrative department which has been successively under the direction of Mr. R. L. Thomas, Mr. F. A. Allner, and Mr. G. W. Spaulding.

My early work related largely to hydraulic and hydrologic studies, including analysis of rainfall and run-off records of the Susquehanna area and studies of flood probability, stage relations, etc. The hydraulic work included analysis of turbine tests of various kinds, conduct of and reports upon other tests relating to turbine discharge and the benefits resulting from various methods of hydraulic operation.

During the past 10 years this work has been more directly concerned with the relationship of hydrology and hydraulic tests and computations to the results of operating experience. Analyses made of storage and river stage relations, of turbine performance, of the results of operation during drawdowns, floods, and other special situations have led to [16111] improvements in operating practices, in efficiency or in capacity. I have collaborated with Mr. Watchorn in studies relating to economic operation of the Holtwood and Safe Harbor hydro plants in conjunction with the interconnected steam system, and in studies of coordinated operation of the several power systems in F. P. C. Areas 5 and 6 and the benefits obtained from such operations.

Over a period of years, I have also worked with Mr. Watchorn in the development of methods of analysis of the capacity requirements of a hydro-steam system, the application of which methods has been discussed at length in the testimony of Mr. Watchorn.

I have made from time to time studies relating to the energy and capacity benefits resulting from additions to or modifications of the Holtwood and Safe Harbor plants and from other possible hydro developments.

Q. Mr. Davis showed in Exhibit 64, Table I, Line 1, all of the Hydro Production Plant of Penn Water as assigned to the "Pool." His testimony at pages 10816 and 11104 of the transcript and at other places in the record was that he intended to allocate all property on the basis of use. Is all of the Hydro Production Plant of Penn Water used for services to all of the companies listed in columns 1 to 5 of Table I of Exhibit 64, and considered in Exhibit 64 as customers of Penn Water? [16112] A. No, all of the plant is not used for all customers.

Q. Is the 25 cycle portion of Holtwood used for service to all customers? A. No, the 25 cycle service is provided to only two customers, Baltimore and Pennsylvania Power & Light. In addition, a very small amount of the 25 cycle generation is converted for use in the 60 cycle system.

Q. What part of the 25 cycle generation is converted at Holtwood? A. During recent years an average of about 4 percent, and this conversion is as high as 4 percent only because of the exceptional situation existing in these recent years. Furthermore, the conversion from 25 cycle to 60 cycle is offset in part by conversion from 60 cycle to 25 cycle. The net annual amount of conversion from 25 cycle to 60 cycle has recently averaged only 2 percent of the 25 cycle generation.

Q. For what purpose is 25 cycle generation converted to 60 cycle at Holtwood? A. To increase the amount of 60 cycle service available from Holtwood; but since a large part of such conversion takes place at times when Penn Water has an ample supply of 60 cycle generation for use in supply of the firm Pennsylvania loads, conversion at such times is only for the purpose of supplying additional interchange services.

Q. Is the 60 cycle portion of the Hydro Production [16113] Plant and the Holtwood Steam Station used for service to all customers? A. No. Except for almost negligible amounts of generation it is used only for service to Metropolitan Edison Company at York, Pennsylvania Power & Light Company's Lancaster Division, and Philadelphia Electric Company's Coatesville Division.

Q. What are the almost negligible exceptions that you noted in your last answer? A. A small part of the 60 cycle generation at Holtwood may be converted at Holtwood and the resulting services delivered at Highlandtown. A small part may reach Baltimore or Washington over the 220 kv system. A small part of the Holtwood 60 cycle generation may be converted at Safe Harbor to provide service to the Pennsylvania Railroad.

Q. What part of the total Holtwood 60 cycle generation is involved in these minor exceptions? A. About 2 percent of the total Holtwood 60 cycle generation may be used for service to Baltimore and the Pennsylvania Railroad.

Q. Have you prepared a tabulation showing certain data for the years 1941 to 1946 with respect to the 25 cycle and 60 cycle hydro generation at Holtwood, the send-out to the two 25 cycle customers, and the use of the Holtwood frequency changers? [16114] A. Yes, I have.

Q. Is this tabulation, marked Exhibit 349, the tabulation you have prepared and which I have just described? A. It is.

Q. Beginning on page 11455 Mr. Sturtevant asked Mr. Davis a series of questions relating to the use of the 25 cycle generation at Holtwood. He divided this use into six separate categories. The first two classifications of use of the 25 cycle generation concerned the deliveries to Lancaster and to the Holtwood frequency changers. Does the tabulation, identified as Exhibit 349 show the amount of 25 cycle generation delivered to Lancaster and to the frequency changers? A. Yes, it does.

Q. Is the balance of the 25 cycle generation sent to Baltimore? A. Yes, it is.

Q. What is the ratio of the 25 cycle net sendout to Baltimore to the total 25 cycle hydro generation at Holtwood? A. For the average of the five years, 1941 to 1945, the ratio was 90.5 percent and for 1946, 91.5 percent. Either of these figures might be considered to be typical of average flow conditions, but not of average load conditions.

Q. Why do you say these figures are not typical of average load conditions? [16115] A. The conversion from 25 cycle to 60 cycle has been higher in recent years than we expect it to be in the near future. Reduced conversion would increase the percentage of 25 cycle sendout to Baltimore.

Q. What factors did you consider in your statement that the conversion from 25 cycle to 60 cycle at Holtwood will be decreased in the near future? A. The large installations now under construction and the planned capacity additions by the utilities in FPC Area 5 are expected to reduce the interchange deliveries in Pennsylvania. The capacity additions planned in Area 6 and the retirement of 25 cycle steam generators in Baltimore will both increase Baltimore's need for 25 cycle hydro. Both these facts will tend to reduce the conversion from 25 cycle to 60 cycle at Holtwood.

Q. The third and fourth classifications of use that Mr. Sturtevant assumed in his questions, depended on the fact that at certain hours there are deliveries by Penn Water at Highlandtown at the same time there are backfeed deliveries to Penn Water on the 220 kv circuits in Maryland. Assuming this to be the fact, does it change your previous answer relating to the use of the 25 cycle generation not sent to Lancaster or not converted to 60 cycles at Holtwood? A. No, that answer is not changed. All the 25 cycle services supplied at Highlandtown are consumed on the Baltimore system.

[16116] Q. The third classification involved the assumption that 25 cycle energy, delivered by Penn Water at Highlandtown, was converted by Baltimore to 60 cycles and delivered to Penn Water as backfeed. Is any energy from Highlandtown so converted and delivered? A. It is very unlikely. There may be very small amounts of energy from Highlandtown used in Baltimore Company's frequency changers. Such amounts must be small, for this operation would take place only when the delivery at Highlandtown is greater than the 25 cycle load in Baltimore; and this could happen only on Saturdays, Sundays or holidays and a few off-peak hours of week days in high flow. But then, because of high flow, it is most unlikely that any of the resulting 60 cycle energy would be delivered by Baltimore as backfeed to Penn Water.

Q. Did you furnish to Mr. Zinder the figures appearing in column 1 of Table 1 and of Table 2, both of Schedule B and appearing at pages 24 and 25 of Exhibit 319? A. Yes.

Q. Where were those figures obtained? A. They were obtained from the records of the company and the testimony and exhibits in this case.

Q. Do you agree generally with all the statements of fact contained in Exhibit 319, with respect to the use of the facilities of Penn Water & Power Company and S. T. Company? [16117] A. Yes.

Q. Were you directed by the officers of Penn Water to prepare a report showing corrections that should be made to Mr. Davis' Exhibit 64? A. I was.

Q. Is the document which has been identified as Exhibit 350 the report showing the corrections to Mr. Davis' Exhibit 64 that you have just referred to? A. It is.

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[16123]

CARL WILLIAM WATCHORN

CROSS-EXAMINATION

By Mr. GOLDBERG:

Q. Mr. Watchorn, there are a number of matters on which you were to make investigation and report. One of them [16124] was with respect to the conference on June 25, 1946, between yourself, Mr. Spaulding, Mr. Von Eiff, Mr. Roland and Mr. Davis. Have you made any investigation to ascertain whether there is a memorandum covering that conference? A. I have.

Q. And what have you found? A. I found that there was such a conference and that Mr. Loane, in addition to the parties you mentioned, was also present at that conference.

Q. Were you able to ascertain whether there is a memorandum covering that conference? A. Oh, yes, there is a memorandum.

Q. So that you have now refreshed your recollection with respect to the subject matter at that conference, is that right? A. That is right.

Q. And having refreshed your recollection you are now aware, are you not, that in that conference Messrs. Roland and Davis were advised that the 295,000 KW dependable hydro capacity was made up of several components? A. I am not in a position to state from my refreshed recollection of that memo that that statement is so.

Q. You mean your memo does not enable you to state what was discussed with respect to the makeup of the 295,000 KW dependable hydro capacity, is that right? [16125] A. If you ask me what was discussed I can tell you, but I can't answer that question without giving a tremendous amount of qualifications relating to it.

Q. Well, let's see if we can avoid qualifications and get to the heart of what was discussed. You are aware, are you not, that the makeup of the 295,000 KW reported as

dependable hydro capacity was discussed in that conference? A. That is correct. One of the subjects of that conference and one of the two subjects discussed related to the amount of 295,000 KW.

Q. Now then, in that discussion, having refreshed your recollection about the discussion, you know, do you not, that Messrs. Roland and Davis were advised that the base component of the 295,000 KW was 161,000 KW, which was determined by applying the energy available from the hydro generation during the week of the most adverse river flow to the actual 1945 load curve for the week of the maximum load on the interconnected system, using a weekly recovery cycle? A. I am not so aware.

Q. It is your statement that they were not so advised? A. Categorically the answer is that they were not so advised.

Q. I take that to mean if you were limited to a yes or no answer, you would have to say no, is that right? A. That is correct.

[16126] And that if you were permitted to explain your answer you could say yes with an explanation, is that right? A. No, I wouldn't say yes with an explanation, I would give the explanation.

Q. Let us have your explanation, then we will see whether you can say yes. A. My recollection of that meeting now with respect to the discussion relating to dependable hydro capacity, is that either Mr. Davis or Mr. Roland stated they were interested in determining a comparison between the 161,000 KW reported by Baltimore Company for the pool in the pool Form 12 report for the year 1945, with the 295,000 KW—in Schedule 16—the 295,000 KW filed by Penn Water for the Holtwood-Safe Harbor System.

Q. In Schedule 16? A. In Schedule 16, that is correct. One or the other started the discussion and led it for a considerable way through. It was quite apparent that they had made their own conclusion that the substance of

the question that you have asked me was the manner in which the 295,000 was derived, without asking whether that was so. The conference then went on with reference to Schedule 2 and instead of going to Schedule 2 itself the conference went to the notes to Schedule 2 in the Penn Water-Safe Harbor System report—I mean the Holtwood-Safe Harbor System report—filed by Penn Water, [16127] in which my recollection is there was a number shown for the month of December for weekly use of pondage, with refill as of the beginning of the following Monday morning, of 207,000 KW, whereas the pool report filed by Baltimore Company showed an amount of 161,000 KW.

The question was as to how we could reconcile those two figures. Mr. Davis and Mr. Roland were informed in substance—

Q. Were what? A. Were informed in substance; I don't know the exact words—that the Baltimore Company's determination of 161,000 KW as shown in Schedule 2 was based on the actual experienced loads for 1945 with weekly refill, and that the 207,000 KW shown in the note for the corresponding condition by Penn Water was based on estimated 1946 loads.

In other words, there was no implication or intention in our answer in any manner whatsoever that the 207,000 was derived from the 161,000 as a component.

They then asked how the difference could be explained. It was explained that a part of the difference related to the treatment of the supply of Penn Water and Safe Harbor to Metropolitan Edison in 1946, which supply did not exist in 1945. The balance of the difference was a result of the difference in the load basis used by Penn Water and Safe Harbor, as contrasted with that used by Baltimore Company, Penn Water's estimate being based on estimated 1946 load with [16128] Baltimore Company's determination being based on actual load, actual load for 1945.

I would have to check as to whether the difference in the treatment with respect to M. E. was 10,000 KW or 6,000 KW. It is one or the other of those two numbers but the difference is quite inconsequential. The correct number is that 10,000 KW was the difference as to the treatment of M. E. and 36,000 KW was the difference resulting from the treatment of the load.

No reference, in my recollection, was made with respect to Schedule 2 itself. However, this same note showed for complete refill of the Safe Harbor pond, in the table in which the number of 207,000 KW was shown, for complete refill of the Safe Harbor pond at the beginning of the following week for the month of December, 207,000 KW, and showed an additional amount of 59,000 KW which would be the result of the use of the Safe Harbor pond for the stated specified conditions over the period of the week without complete refill at the beginning of the following Monday morning, with the result that the total amount shown using Safe Harbor pondage was 266,000 KW; and I think the memo states that Mr. Davis asked if the 88,000 KW difference between the 295,000 KW shown on Schedule 16 and the 207,000 KW shown in the note to Schedule 2, was that amount, or whether the 59,000 KW was the result of the use of Safe Harbor's pondage.

[16129] He was told that at times that was so and that at other times it would be the result of flows in excess of the most adverse flow.

The question was then asked if the remaining 29,000 KW was not the result of the use of flows higher than the most adverse, and there was a statement to the effect that it could be considered in that light.

In addition it was pointed out—my recollection with respect to this matter is that Mr. Spaulding made this statement, and further my recollection of my impression of that time is that Mr. Spaulding had in mind not Schedule 16 of Form 12, but rather, his cost of service study, which is Exhibit 35 in this case.

Q. Did he express that or is that something you are assuming? A. If I may go on in my own way we will straighten that out a little later. It was my recollection of my impression, and on further check with Mr. Spaulding he assures me that that was his intention as of that time.

In that connection he stated that the 295,000 KW was a judgment figure and pointed out that on the basis of seasonal use of Safe Harbor storage we would obtain an assured capacity of the Holtwood and Safe Harbor plants of 260,000 KW and, making an allowance of 15 percent reserve, there would be the equivalent of 39,000 additional reserve value, resulting in a [16130] total dependable capacity of 299,000 KW.

There is a further note in the memorandum to the effect that Mr. Spaulding pointed out that if the study in Exhibit 35 had been made on an assured basis, that substantially the same result would have been obtained as if made on the basis of using a judgment figure of 295,000 KW.

There is a further statement in that memo that the basis for Penn Water's estimates of 1946 loads for the interconnected system, were based on prewar experience relating to loads, and there is a further statement that a suggestion was made to both Messrs. Davis and Roland that they confer with their fellow workers in the Federal Power Commission who, we understood, were working with the Army Engineers investigating the feasibility of new hydro-electric developments, pointing out it was our understanding that they were making studies on the basis of seasonal use of pondage and that their load shapes were based on the 1940 loads.

I think that covers that memo relating to the conference with Messrs Davis and Roland as of June 25, 1946.

. . .

[16135] Q. Is it your testimony, Mr. Watchorn, that the 295,000 KW reported as dependable hydro capacity in

the 1945 FPC No. 12 report, filed by Penn Water, was merely a judgment figure? A. No, that is not my testimony.

Q. Your testimony was that the 295,000 KW as shown in Exhibit 35 was merely a judgment figure? A. That is correct.

Q. And it is just happenstance that the two come out together? A. Yes, I think that is fair.

[16141] Q. Now then, isn't it the fact from your review of the memorandum that it appears that at no time during the conference was it suggested that the determination either by Mr. Spaulding in Exhibit 35 or the determination in FPC Form 12 for 1945 of 295,000 KW, was based upon the probability method as testified to in this case? A. That is not correct, Mr. Goldberg.

Q. You state that in that conference they were advised that the probability method was followed in determining the 295,000 KW in reporting that amount in FPC Form 12 for 1945? A. No, I did not say that, Mr. Goldberg.

Q. Was it suggested to them—that is, Roland and Davis—that the probability method had been followed in arriving at the 295,000 KW for Form 12? A. The second complete paragraph on page 5 reads as [16142] follows:

“Mention was also made of probability as another approach to determination of the 295,000 KW dependable hydro capacity. The purpose of this study was to show that the same reliability of service could be provided with the Holtwood-Safe Harbor hydro capacity replaced by at least 295,000 KW of steam capacity.”

And further referring to the note to Item 1(b) of Schedule 16 of the Form 12 report for the Holtwood-Safe Harbor system filed by Penn Water for the year 1945, which was available to Messrs. Davis and Roland prior to the meeting or the conference of June 25 and with respect

to which they stated they were interested, relative to the calling of this meeting, note Item 1(b) is as follows:

"The dependable capacity available from the system hydro plants was determined in accordance with the instructions for Schedules 2 and 16. This determination is based on estimated loads for the year 1946. It takes into account seasonal variations in the firm power load of the interconnected system, peaking capabilities of system steam capacity, scheduled steam maintenance requirements, frequency of occurrence, duration and magnitude of low flows in the various seasons throughout the year and frequency of occurrence and magnitude of high flows, together with the requirements for emergency [16143] use of stored energy to carry the system load during periods of forced outages of large amounts of system steam capacity."

That, although not using the word "probability" in that paragraph, spells it out so clearly that anyone should have no question but that the theory of probability was the sole and only basis for the determination of the 295,000 KW reported in the schedule thereto.

Q. Was that what Messrs. Roland and Davis were advised in the conference on June 25, 1946, that the sole and only basis— A. They didn't ask that question.

Q. —was the probability method? A. They didn't ask that question and they had the report with them and nobody stopped them from reading it. It was assumed they had read it and they raised no question as to what the meaning of that note was.

Q. You say they were not told that because they didn't ask that question, is that right? A. Well, I don't know as to that particularly. All I am stating is that they didn't ask the question.

Q. And therefore nothing was said about it, is that your point? A. There was something said. I just

quoted here the second paragraph on page 5 where it was stated that, "Mention [16144] was also made of probability as another approach to the determination of the 295,000 KW dependable hydro capacity." So, Mr. Goldberg, I have to say that mention was made of probability as being a basis for the determination of the 295,000.

Q. Not as the sole basis for the determination but only as another approach in determining dependable hydro capacity, isn't that so? A. Talking about—

Q. Let's talk about what you said in the memorandum, isn't that so?

. . .

THE WITNESS: That is what the memo states, yes.

By MR. GOLDBERG:

Q. And that is what they were advised that it was merely another approach that could be used? A. The memo so states but as I have stated previously the 295 dependable hydro capacity was discussed at that conference in two different lights.

. . .

[16151] Q. Did I understand you to say during your cross-examination that you had first determined that outage for scheduled maintenance could be treated as an additional load, that you had first determined that in June or July, 1945? A. That was one of the factors determined as of that time. Another factor I overlooked the other day when you were asking that general line of questions, is a very important consideration as to the treatment of the load carrying capabilities of the hydro plant and the reductions in such load carrying capabilities of the hydro plants were also treated as an addition to the load.

. . .

[16171] Q. What is the maximum in terms of feet for the 6 million kilowatt hours? Is it 12 feet? A. That is about 12.2 feet for Safe Harbor, and I don't know, I cannot recall

at this moment just what elevation we used for Holtwood in that matter.

. . .

[16185] Q. I want to show you an article written by Mr. Spaulding on "The Coordinated Operation of Hydro and Steam Capacity in Electric Power Systems," which appears in Volume 66 of the 1944 American Society of Mechanical Engineers Transactions. The article begins at page 545 and I see that you apparently have a copy of your own; is that right? A. That is a copy of one of my coworkers.

Q. Well, let me just call your attention, then, to the part that I was interested in. On page 548 of the volume referred to, this paragraph appears and runs over to page 549:

[16186] "It is necessary to emphasize that the amount of hydro capacity which may be available from draw-down cannot be considered as replacing the entire system reserve requirements. Obviously, it is impossible for pondage to be used as protection against all outages of steam capacity, for these are almost continuously existent; in low flow the available pondage would soon be exhausted, as opportunities for refill would be inadequate. Neither could pondage provide protection against errors in load estimates, which must be made several years in advance, nor could it provide capacity to cover scheduled maintenance, where required during the peak load period of the year. However, under normal conditions, pondage might be considered for about one-third of the total required system reserve."

I have correctly read that paragraph, have I not?
A. That is correct.

. . .

[16187] Q. I see. Well, I will let you read it, I assure you, but right now let me ask you if you agree with the state-

ments made in the paragraph I have just read. A. I think that, in the absence of the portion of the paragraph to which I have just made reference, that the statement in the paragraph that you have just read is a conservative treatment of that problem and as of that time, I was in perfect accord with it.

TRIAL EXAMINER: What year was that?

THE WITNESS: That paper was presented at a meeting April 3 to 5, 1944.

MR. GOLDBERG: Now, may I have the last answer read?

TRIAL EXAMINER: Yes.

(Answer read by the reporter.)

By MR. GOLDBERG:

Q. Now, do I understand that though you were in accord with the statements contained in that paragraph at the time it was presented, you are not today in accord [16188] with those statements? A. Not to the same extent as of then, for the reason that since that time I have found it impossible to make an evaluation of all the relevant factors.

Q. And these relevant factors to which you refer are those that came to you in the latter part of June and beginning of July, 1945? A. Oh, no, the factors I am speaking of there, most of which are mentioned in Mr. Spaulding's paper.

Q. You mean today you are better able to evaluate the factors referred to in that paragraph, or in the paper, than you were at that time? A. Oh, I have since evaluated them. My testimony is related to that evaluation, whereas of that time I couldn't make that evaluation.

Q. But now you don't agree with that paragraph any more, because you have been able to make an evaluation? A. Not in its entirety, that is correct.

[16191] Q. You don't know today whether you can agree with the statement that "However, under normal conditions, pondage might be considered for about one-third of the total required system reserve;" is that right?

. . .

[16192] THE WITNESS: Yes, sir. My answer is that I do know whether or not I agree with that statement.

By MR. GOLDBERG:

Q. Do you? A. No, I do not agree with the statement.

. . .

[16194] Q. You had expressed a desire to read a paragraph into the record, and I would like to give you that opportunity now. And just so the reference can be to the copy as it appears in the official transactions, will you tell us on what page of said transactions it appears? A. It appears on page 547, and is contained in two paragraphs at the top of the column to the right on that page, and reads as follows:

[16195] "In the foregoing procedure, there are certain hydro resources which have not been fully evaluated. Additional hydro capacity is available for something less than 93 percent of the time, resulting from river flows in excess of those used in capacity computations. Such capacity is available for the release of steam units, for maintenance work, in addition to that scheduled in advance, and much maintenance of this nature has recently been necessary."

Parenthetically, this last condition refers to the conditions that existed during the war.

"Additional hydro capacity is also available from the short-time use of pondage when required by the simultaneous forced outage of a large number of steam units, even with stream flows lower than those used in capacity computations. The extent to which a system

would be willing to rely on such capacity as firm would be influenced by the forced outage record of its own or similar steam generating equipment, and upon the amount of other reserve capacity then available on the system.

“Perhaps someone will eventually evaluate and properly combine all the pertinent factors by the application of a probability theory. As this theoretical solution now seems impractical, an attempt has been made to approximate the possible use of pondage in the light of the forced outage experience of steam generating equipment, [16196] the ideal objective still being that a combined hydro and steam system should have substantially the same degree of reliability as an all-steam system.”

Q. And in an earlier answer you have indicated that those two paragraphs should be taken into account in connection with the paragraph that I read into the record from the article: is that right?

A. Yes. What I meant there was that since I have now been able to make the evaluation, expressed in particularly the last paragraph I have just quoted, I no [16197] longer agree with the last sentence of the paragraph in Mr. Spaulding's paper that you had quoted.

[16251] Q. Let's see if I can inspire you, as I did yesterday. Do you remember, on June 16, 1941, you and Mr. Loane jointly prepared a discussion of a paper by H. C. Forbes and K. F. Bellows of the Consolidated Edison Company of New York relating to generating system capacity reserves in connection with probability? A. I have so testified.

[16252] Q. Now, then, this was stated by you and Mr. Loane:

Q. "We have found no easy way of reducing the variations in magnitude of stream flow to a probability basis and at the same time retain the essential variations in flow with respect to time."

That appears there, does it not? A. That is correct.

Q. What did you mean when you said that? A. What I had stated before that the previous work I had done in this matter involved a tremendous amount of calculations to get a result, which even then did not take into account all the pertinent factors involved.

Q. Do you mean today you have found an easy way of doing what is there referred to? A. Oh, yes, I testified to that on cross examination by you.

Q. So that today you have found a way of reducing the variations of magnitude of stream flow to a probability basis and at the same time retain the essential variations [16253] in flow with respect to time; is that right? A. That is correct, and that was the point of the passage in Mr. Spaulding's paper that I desired to read into the record yesterday, which you so kindly permitted me to do.

. . .

[16254] Q. In that same paper, you and Mr. Loane stated, did you not, as follows:

"The particular generating system in which we are interested is a coordinated combined hydro and steam system. The hydro plants are low head, approximately 50 feet, and operate run of river, as distinguished from seasonal storage."

Is that right? A. That is correct.

Q. You were there referring to Safe Harbor and Holtwood? A. That is correct.

. . .

Q. I have no subsequent questions. A. Oh, then, it so states on that page.

Q. In that same paper, you said this, did you not:

"The valleys in the steam generation requirements either in the case of an all-steam system or combined hydro and steam system should be utilized for maintenance of the steam units. We have found it convenient in our probability studies to treat the scheduled outage of steam equipment as an addition to the load and to consider that [16255] all the steam units are available at all times except for possible forced outages. The procedure is conservative—" that has a familiar ring? "—although slightly inaccurate and results in a considerable simplification of our computations."

You so stated, did you not? A. That is correct.

Q. What was the date of that paper? A. I want to give a qualification respecting this.

Q. Before you do that, will you tell us the date of the paper? A. The date of this paper is June 16, 1941.

Q. Now, will you go ahead with your qualification?

A. And in preparing my testimony with respect to this matter, I merely checked the title of the discussion, and the paper to which it referred, without reading its text, and apparently, between the time that this paper was prepared and subsequent work, that I had forgotten that we had done on this and rediscovered this process at a later date. In fact, there would be no point with respect to this particular matter had I recalled that this was the fact, to have not so stated, in my direct testimony and cross examination.

[16256] A. I would like to correct that and say, in fact, there would be no point, had I been aware of this matter, to have not so stated in my direct testimony, in contrast to which there would have been no point with respect to this particular matter.

Q. Let me see if I can unravel that in my own mind. I understand that what you are trying to do is reconcile the statement with respect to the time of discovery of the addition of scheduled outages of steam equipment to the load, and your statement on cross examination that you first discovered it in June of 1945. That is what you are trying to do, reconcile the two? A. That is correct.

[16332]

REDIRECT EXAMINATION

[16344] By Mr. SPARKS:

Q. In Mr. Reiblich's question at the top of page 16261, he referred to Baltimore Company's interpretation of the instructions of Form 12, relating to dependable hydro capacity, stating that Baltimore Company [16345] considered "the difference between the highest annual one-hour peak and the maximum base steam load requirements for the minimum seven-day river flow reported on for that period of the year." In that interpretation was Baltimore Company assuming the coincidence of minimum flows with maximum loads? A. They were, and that is one of the objections to using that rule of thumb method without proper consideration of probability, for we know that we do not frequently get such a coincidence. My criticism has gone largely to the fact that they used the most adverse flow on record "for that period of the year" together with an estimate of an "annual one-hour peak" that was not as large as past experience had indicated must be expected for future peak loads.

[16392]

H. ZINDER

CROSS EXAMINATION (Resumed)

By MR. GOLDBERG:

Q. On page 2 of Exhibit 319, Mr. Zinder, you speak of the operations of the system. That is the paragraph immediately preceding the caption "Summary of Results." Do you see that? A: Yes.

Q. The system you there referred to consists of what? A. The system of Penn Water.

Q. So that when you speak of the operations of the system, I take it you mean only the operations of Penn Water? A. Essentially so.

Q. So that when you stated that the determination of what would be a reasonable and feasible method of assigning property and costs is based on a study, among other things, of the operations of the system, you were speaking essentially of a study of the operations of Pennsylvania Water and Power Company? [16393] A. That is right.

Q. Did you study the operations at all or any of the other companies comprising the interconnected system? Namely, Safe Harbor, the Washington Company, and the Consolidated Company? A. I didn't study the operations of those systems as complete systems. Certain transactions between those systems and Penn Water, which appeared in the study of the Penn Water System.

Q. Did you study the operations of the Consolidated, Washington and Safe Harbor Companies in so far as they had a bearing on the transactions with which you were concerned? A. I think so.

Q. What transactions were those? A. The transactions that I was concerned with are those between Penn Water and Baltimore Company, the service rendered by Penn Water and Baltimore Company.

Q. Were you concerned, in your study, with the services rendered by Baltimore to Penn Water? A. No, not directly.

Q. What do you mean by "not directly"? A. Well, it was necessary, in determining the services rendered by Penn Water to Baltimore, to determine the use of certain facilities. And over some of those facilities, [16394] some services were rendered by Baltimore to Penn Water. To the extent that that entered into my studies, or were necessary in connection with my studies, they were considered.

Q. Did you consider that there were services rendered by Penn Water to its Pennsylvania customers in Pennsylvania? A. No, not as far as determining any costs of such services was concerned.

Q. To what extent, then, did you concern yourself with the services rendered by Penn Water to the Pennsylvania customers? A. Only to the extent of determining that any of the facilities used in connection with those services or any of the costs involved in connection with those services also involved facilities or costs in connection with service by Penn Water to Baltimore.

Q. I understand, from that last answer, that you studied the services rendered by Penn Water to the Pennsylvania customers in Pennsylvania for the purpose of ascertaining whether the facilities involved in rendering those services had a bearing on the costs you were allocating to Baltimore; is that right? A. That is right. In other words, whether any of those facilities were also facilities involved in service to Baltimore.

[16395] Q. From your studies, are you able to describe the physical operations of the interconnected system? A. In a general way, yes.

Q. Will you do so? A. First of all, Penn Water has a hydro plant and steam plant. The hydro plant has both 25 and 60-cycle units installed. The steam plant has only 60 cycle units. From the Holtwood hydro plant, there is the Highlandtown line, which carries 25-cycle energy from the Holtwood plant to Baltimore. I might say that, also, at the Holtwood plant, there is the Holtwood substation. Also, out of Holtwood, there is a line to Lancaster, for the

purpose of delivering 25-cycle energy and services to Lancaster.

There are lines from Holtwood to Lancaster and to Coatesville for 60-cycle service.

From the Safe Harbor plant, there are two major 220 kv lines for the transmission of 60-cycle energy and services to Baltimore. One is known as the Westport line and the other is the Riverside line. From a point on the Westport line, there is a connection to Potomac Electric Power Company. Also from the Safe Harbor plant there is a 25-cycle single phase line known as the Perryville line, used primarily for service to the Pennsylvania Railroad.

There is also a line from the Holtwood plant for [16396] service to Metropolitan Edison.

I think that that is both a brief description of the facilities and the operations. The Safe Harbor plant generates both 25-cycle single phase service and 60-cycle three-phase service.

Q. For the most part you have described the physical facilities of the system, isn't that so, rather than the operations of it? A. Well, I have tried to describe the physical facilities and the use made of those facilities, which, in turn, represents an operation.

Q. How does the interconnected system operate with respect to the rendering of service to Pennsylvania Power and Light Company at Lancaster, for example?

A. With respect to the 25-cycle service to Lancaster, that is service rendered by Penn Water alone. As far as the operation of the interconnected system, of what you call the interconnected system, is concerned, for service to Lancaster, I can't describe it in detail, except to say that my determination found that none of the facilities used for that service, as far as Penn Water was concerned, were involved in rendering service to Baltimore, on the part of Penn Water.

[16397] By MR. GOLDBERG:

Q. How did you determine that? How did you go about finding that out? A. Well, there is no major and direct connection between the transmission line to Lancaster and Baltimore, and that is also based on discussions with the company people.

Q. Who? A. Mr. Loane.

Q. Is there any major connection between Baltimore and the railroad for service through the Conestoga Substation, through the Safe Harbor plant?

. . .

THE WITNESS: I can't answer that.

By MR. GOLDBERG:

Q. Why can't you answer it? Do you mean you have not made any studies that would enable you to answer it?

A. I did go into some of these other operations at the time of my study, but my study was concerned with the service rendered by Penn Water to Baltimore. Your question, as I understand it, deals with a connection between Baltimore and the railroad.

Q. As I understood your earlier answer with respect to service at Lancaster, one of the elements you considered was the lack of a major connection between Baltimore and the service of Lancaster; is that right? [16398] A. Yes.

Q. And you derived that information, you say, in part, from a discussion with Mr. Loane? A. Yes.

Q. Now, since that formed one of your bases for concluding that service to Lancaster had no bearing on your allocations to Baltimore, why didn't you concern yourself with the existence or lack of existence of major connections between Baltimore and other services involved on the inter-connected system? A. Well, I can answer that this way: I did, to the same extent as I described in the case of Lancaster. I think I stated in my exhibit that the costs shown were not less than the amount determined in here. That statement was made because, to some small extent, it

is possible that other facilities were involved, and I did not include those other facilities and other costs.

Q. At the moment I am concerned with your understanding of the operations, because I think you will agree with me that you must have an understanding of the operations to arrive at a reasonable cost allocation. Is that a fair statement? A. Not entirely in this case.

Q. Why not? A. The study which I have presented here is confined [16399] to the service rendered by Penn Water to Baltimore. It is not concerned with all the services rendered by the company or by Penn Water. It was necessary, therefore, for me to concern myself only with those facilities and costs involved in that service.

Q. Now, when you said it isn't necessarily so, in this case, in response to my question, I take it you were relating that to the very narrow function you were performing in presenting your testimony in this case; is that right?

. . .

A. Maybe my objection, or not objection but difference, has to do with a function I am performing. I considered the single problem, namely, service by Penn Water to Baltimore, and my studies were related to that.

By MR. GOLDBERG:

Q. Are you saying that you can arrive at a reasonable allocation with respect to Baltimore Company, considering the operations of the interconnected system and the other services that Penn Water renders, by only concerning yourself with the services rendered by Penn Water to Baltimore Company? A. Let me try to put it in my words. I am not sure I have your words clear.

[16400] Q. All right. A. I believe I have arrived at a reasonable cost of those services, or at a proper cost of those services rendered by Penn Water to Baltimore.

Q. And you say that you can arrive at that without considering other services rendered by Penn Water to

other customers in their relationship to the service rendered to Baltimore?

A. I say that I can arrive, and have arrived, at such a cost by considering the Penn Water system and those facilities and costs incurred in connection with its service to Baltimore.

By MR. GOLDBERG:

Q. And you have done that without regard to the relationship of the services rendered by Penn Water to Baltimore and other services rendered by Penn Water to other customers? A. No, I wouldn't say that.

Q. Why not? A. I have gone sufficiently far, I believe, in my review of the operations of the system, to determine those costs which I believe are properly allocable to Baltimore. [16401] In connection with that determination, no part of the costs, for example—or no portion of the payments made to Safe Harbor are included, and no portion of the costs of such purchases as Penn Water makes from its other customers has been assigned to Baltimore. To the extent that some of those purchases, or some of those services purchased, are used to render service to Baltimore, to that extent—and their costs have not been included here—I would say that the cost that I have shown is understated to that extent.

Q. Have you concluded, in your studies, that the payments made to Safe Harbor by Penn Water had no bearing on the cost of service to Baltimore by Penn Water? A. I would prefer to go to the statement I have made in that respect in the exhibit in answer to that question.

Q. Are you looking for the statement you make at the bottom of page 4 and at the top of page 5 of your exhibit? A. Yes, that is right. At that point I state that—let me read that statement—

“In addition to the costs associated with its own investments, Penn Water has other costs. It receives

services from Safe Harbor Water Power Corporation, hereinafter referred to as Safe Harbor, and it engages in interchange transactions with its customers [16402] resulting in the receipt as well as delivery of energy and services. The costs associated with these transactions must also be allocated to the use made of these services. Consideration was given to the character of these services. It was found that some of the costs associated with these services might properly be allocable to Baltimore but that the amount involved would be relatively small. Accordingly, no part of the payments associated with these services has been assigned to Baltimore. Thus it may be stated that the cost to serve Baltimore is no less than the amount determined herein."

[16518] Q. Sources that are available only on an as-if-and-when basis are not considered by you as firm power commitments; right? A. That is right.

[16581]

G. W. SPAULDING.

DIRECT EXAMINATION

[16584] By MR. SPARKS:

Q. Beginning at line 15 of page 906 of the transcript, Mr. Roland testified with respect to the companies from whom Penn Water receives electric energy. What are the facts as respect the receipt of electric energy from Safe Harbor Water Power Corporation by Penn Water?
A. Penn Water receives all of the electric services including electric energy available from the Safe Harbor Hydro-electric Development, owned and operated by the Safe Harbor Water Power Corporation. Such services are sup-

plied to the transmission facilities of Penn Water by Safe Harbor within the latter's project boundary, in part for delivery by Penn Water and its wholly owned subsidiary, S.T.Co., from Safe Harbor to Baltimore Company at points in Maryland; in part are delivered by Penn Water to the joint customers of Penn Water and Safe Harbor in Pennsylvania; in part are delivered by Penn Water and S.T.Co. to the Pennsylvania Railroad Company in Pennsylvania and Maryland; and in part are delivered by Penn Water to Metropolitan Edison Company.

Q. For what purpose does Penn Water receive such electric service from Safe Harbor Water Power Corporation? A. All of such electric services are used in public service either by Penn Water or by the public utilities' customers of Penn Water or the joint customers of Penn Water and Safe Harbor, except for such amounts as may be consumed [16585] in transmission and other system losses.

Q. At line 5 of page 909 of the record, Mr. Roland testified that the 110 Kv. line extending from Baltimore Company's Philadelphia Road Substation in Baltimore, to its Gunpowder Substation in Maryland, was owned by the Susquehanna Transmission Company of Maryland, but was leased to Baltimore Company. Is this line in fact leased to the Baltimore Company? A. No, it is not. This 110 Kv., 60 cycle transmission line, approximately 9.6 miles in length, is one of the several special facilities provided by Penn Water and S.T.Co. for the sole use of Baltimore Company under the contract identified as Items H and I.

Prior to the Supplemental Agreement of June 1, 1931, certain special facilities, including this transmission line, were furnished at a specified contract rate, which rate was considered as a rental charge. Under the Supplemental Agreement of June 1, 1931, there is no itemized charge relating to these special facilities. The compensation for the use of this line is included in the lump sum payments under that contract.

Q. Beginning at line 11 of page 912 of the record, Mr. Roland testified with respect to the receipt of payments by Penn Water from its customers, including Pennsylvania Power & Light Company and Philadelphia Electric Company. For what [16586] purpose does Penn Water receive such payments? A. Penn Water receives payments from the Pennsylvania Power and Light Company and the Philadelphia Electric Company for all of the services, including electric services rendered to those companies. The payments received for these services were received by Penn Water, acting for itself and as agent for Safe Harbor. The electric services so rendered are rendered jointly by Penn Water and Safe Harbor.

MR. SPARKS: I would like to offer this document for identification.

TRIAL EXAMINER: The document may be marked for identification as Exhibit Number 352.

(The document referred to was marked for Identification as Exhibit Number 352.)

By MR. SPARKS:

Q. Does this exhibit show the demand, energy and special facilities charges included in the revenue received by Penn Water from all of the Pennsylvania customers? A. Yes.

Q. And they were all revenues received for services rendered jointly by Penn Water and Safe Harbor except to Metropolitan Edison Company for the year 1946? A. That is right.

Q. At the top of page 913, Mr. Roland testified with respect to the use of the services by Baltimore Company, [16587] Pennsylvania Power & Light Company, Philadelphia Electric Company and Metropolitan Edison Company, which Penn Water delivered to such companies. Is it a fact that all of the services, including electric energy, which are furnished to those customers, are resold by them?

A. No, not all of such services. Certain amounts of electric energy delivered to such companies are consumed in their respective power systems as losses. Of the other electric services supplied, such as power factor cooperation, voltage regulation, frequency control, spinning reserve or capacity service, I am not aware that such services are all resold; rather, it is my opinion that such services are used by the receiving companies in part to augment their own services and in part are consumed within the respective electric systems in the same manner that energy losses are consumed.

Q. Beginning at line 4 of page 914 of the record, Mr. Roland testified with respect to the deliveries of energy by Penn Water to the Pennsylvania Railroad Company at Conowingo and Perryville, Maryland, for the account of Baltimore Company, and also with respect to the deliveries to the Potomac Electric Power Company near Takoma Park, Maryland, for the account of Baltimore Company. Mr. Roland referred in this connection to his Exhibit 37 and certain of the symbols designated thereon. Was Exhibit 37 a map prepared by the [16588] Company? A. It was.

Q. Do similar maps, now prepared and published by the Company, contain the symbol designations referred to as respects Perryville, Maryland; Conowingo, Maryland; and Takoma Park, Maryland, as were shown on Exhibit 37? A. No, they do not.

MR. SPARKS: I would like to offer this map for identification.

TRIAL EXAMINER: It may be marked for identification as Exhibit No. 353.

(The document referred to was marked for Identification as Exhibit Number 353.)

By MR. SPARKS:

Q. Why was the designation of such delivery points changed? A. Because of possible misinterpretation as to the meaning of the phrase "for the account of Baltimore

Company" and specifically because of such misinterpretation by Commission witnesses in the present proceedings.

Q. Was such designation as shown on Exhibit 37 a misstatement of the facts? A. Not in all instances, but it was an over-simplified representation.

Q. What are the facts as respects the interconnection [16589] points at Conowingo and Perryville, Maryland?

A. At Perryville, Maryland, and Conowingo, Maryland, there are interconnections between the transmission facilities of Penn Water's wholly owned subsidiary, S.T.Co., and the electrification facilities of the Pennsylvania Railroad. At both points of interconnection, S.T.Co.'s transmission lines connect with the Railroad's distribution substations supplying its electrified division and electric services are supplied from the facilities of S.T.Co. to the facilities of the Railroad. Although these points of interconnection are referred to as delivery points in the Railroad Power Supply Contract, identified as Exhibit 10, there is no reference in the contract as to which one of the several supplying companies will make such deliveries.

The phrase "for the account of Baltimore Company," shown on Exhibit 37, was intended to refer to the Operating Committee's Memorandum, identified as Exhibit 11 in this proceeding, which provides that for the purpose of computing a division of the total revenues received by Baltimore Company from the Pennsylvania Railroad, the deliveries of electric services, including energy, in the State of Maryland and the District of Columbia shall be considered as deliveries by Baltimore Company, while deliveries of electric services to the Railroad in Pennsylvania shall be considered as deliveries [16589-A] by Penn Water.

Q. On page 9336 of the record, Mr. Roland referred to Schedule 13 of the Holtwood-Safe Harbor Power System Statement to the Federal Power Commission on its Form 12 report for the year 1944, and referred specifically to a note thereto relating to the hourly load supplied to the Pennsylvania Railroad in Maryland by Penn Water and

Safe Harbor for the account of Consolidated Gas Electric Light and Power Company of Baltimore. Was this note, attached to Schedule 13 of the 1944 FPC Form 12 Report, intended in any way to indicate that the energy supplied to the Railroad in Maryland was not a joint supply of Baltimore, Penn Water and Safe Harbor? A. No, on the contrary. The notes attached to Schedules 13 and 14 of the Holtwood-Safe Harbor Power System Statement (FPC Form 12) for the year 1944 were intended to make it perfectly clear that the supply to the Railroad, both in the State of Pennsylvania and the State of Maryland, was a joint supply of Baltimore Company, Penn Water and Safe Harbor.

Q. What are the facts as respects the interconnection point near Takoma Park, Maryland? A. At a point northeast of Takoma Park, Maryland, there is an interconnection between the transmission facilities of S.T.Co. and the transmission facilities of the Potomac Electric Power Company, such interconnection point being merely the division of ownership of a single continuous 220 kv. [16589-B] transmission line extending from Ellicott Substation near Baltimore to the Takoma Park distribution substation of Potomac Electric Power Company, adjacent to the District of Columbia line. Through this point of interconnection, electric services are supplied from the transmission facilities of S.T.Co. to the system of Potomac Electric Power Company and these same facilities are also used for the interchange of electric services.

[16590] However, neither Penn Water nor S.T.Co. has any contract for the supply of electric services to, or the receipt of such services from, the Potomac Electric Power Company. Provisions for such transactions, including interchange, are part of an agreement between Baltimore Company and Potomac Electric Power Company to which Penn Water is not a party. The contract, identified in this proceeding as Item D, between Baltimore Company, Penn Water and S.T.Co., provides that S.T.Co. will provide the

necessary facilities and will transmit over these facilities such electrical power and energy as may be delivered to it at the terminals of its transmission lines for such purposes. Under the contract, identified as Item F, Penn Water, through its subsidiary, agrees to construct and operate the facilities above referred to and to perform at all times the obligations undertaken by Baltimore Company under its agreement with Washington Company.

Q. At pages 929 and 930, Mr. Roland referred to energy supplied by Philadelphia Electric Company to Penn Water at Perryville through the facilities of the Pennsylvania Railroad, stating that such deliveries were considered as interchange delivery by Philadelphia Electric Company to Penn Water and that such energy as is used by the Railroad south of Perryville is considered a delivery by Penn Water to the Railroad for the account of Baltimore Company.

Will you please explain the use of the expression "for [16591] the account of Baltimore Company"? A. Any use by Penn Water of the expression "for the account of Baltimore Company" in this connection is the result of arrangements provided for under a contract between the Pennsylvania Railroad on the one hand and Philadelphia Electric, Penn Water, Safe Harbor and Baltimore Company on the other hand. Such contract, identified as Exhibit 135, is known as the Railroad Parallel Operation Agreement. Under such operations as provided therein, Philadelphia Electric Company frequently supplies amounts of electric services greater than its contractual obligations and some of these electric services, including electric energy, are used by the Pennsylvania Railroad in the sections of its electrification south of Perryville.

Such energy so used south of Perryville is metered within the Railroad system at that point and such supply so metered is accounted for under the contract identified as Exhibit 134 as an interchange transaction by Philadelphia

Electric Co. to Penn Water and a delivery by Penn Water, Safe Harbor and Baltimore Company to the Railroad under contract identified as Exhibit 10.

Q. Are all deliveries to the Pennsylvania Railroad in Maryland, including the District of Columbia, in fact an operating responsibility of Baltimore Company alone?

A. They are not. They are merely a part of the joint [16592] operating responsibilities of Baltimore Company, Penn Water and Safe Harbor.

Q. At line 8 of page 934, Mr. Roland testified with respect to the division of the output of the Safe Harbor plant to Baltimore and Penn Water. Is it a fact that Baltimore Company received in 1944 two-thirds of the output of the Safe Harbor Development? A. It is not.

Q. What happens to the output of the Safe Harbor Hydro-electric Development? A. All of the electric services of the Safe Harbor Plant are delivered within the project boundary of the Safe Harbor Development to the transmission facilities of Penn Water. Penn Water transmits the major portion of such output for delivery to the joint customers of Penn Water and Safe Harbor or to the customers of Penn Water and such output is not transmitted from the State of Pennsylvania. Penn Water also transmits a portion of such output for delivery to the Pennsylvania Railroad at Fishing Creek, Pa., and at Conowingo and Perryville, Md.

The balance of the Safe Harbor output which is very substantially less than two-thirds of the output is transmitted by Penn Water over its 220 kv. transmission lines to Baltimore and Washington.

Q. Can you give the actual proportion of the electric energy generated at Safe Harbor which was delivered over the [16593] transmission facilities of Penn Water by Penn Water to Baltimore Company at or near Baltimore and Takoma Park, Maryland, in the years 1945 and 1946?

A. In 1945, 41 per cent of the energy generated at Safe

Harbor was so delivered and in the year 1946, 33 per cent was so delivered.

Q. Are the facts with respect to such operations for 1946 presently on file with the Federal Power Commission?

A. Such facts are reported in the 1946 Annual Report recently filed by Safe Harbor with the Federal Power Commission in its Form 1 Report and specifically shown on pages 512 and 513 thereof. Related facts are also reported by Penn Water in its Form 1 Report recently filed with the Federal Power Commission for the year 1946 and more specifically shown on pages 508, 512, 513, 514, 522, 523, 524 and 531 thereof with notes relating thereto.

* * *

[16595] Q. On Exhibit 355, being the graphical presentation of power flow across such State line, could you indicate the relative amount of the backfeed from Maryland that is used for the requirements of the Pennsylvania Railroad?

A. The proportion of backfeed transmitted from Baltimore Company or Washington Company to Safe Harbor and used in connection with the requirements of the Pennsylvania Railroad varies from month to month. The percentage of the total backfeed so used was at least 35 per cent in 1946.

Q. Does this latter exhibit indicate by comparison [16596] with Exhibit 40, the abnormalities of the year 1944 resulting from low river flow? A. Yes, and it shows the large amount of backfeed energy received from Baltimore Company in 1944 as compared with 1946 which was very close to an average flow year.

Q. Beginning at line 3, page 935, and extending through line 8, page 941 of the record, Mr. Roland was questioned with respect to the use of electric energy received by Penn Water from Maryland and the District of Columbia for purposes of resale to other electric utility companies in Pennsylvania.

Is all of the electric energy received as backfeed from Maryland and the District of Columbia by Penn Water

used in connection with the firm power obligations of either Penn Water or of Penn Water and Safe Harbor jointly in the State of Pennsylvania? A. No, it is not.

Q. What use was made of the electric energy received as backfeed from Maryland and the District of Columbia by Penn Water which was not used in connection with the firm power obligations of either Penn Water or of Penn Water and Safe Harbor jointly in the State of Pennsylvania? A. Most of such amounts of electric energy were used in connection with the supply to the Pennsylvania Railroad Company, both at Perryville and Conowingo, Maryland, and at Safe Harbor, Pennsylvania, being a part of the joint obligations [16597] of Baltimore Company, Penn Water and Safe Harbor to that customer, while a small amount of such energy was used in connection with interchange transactions involving the delivery of such electric energy by Penn Water or Penn Water and Safe Harbor jointly to their electric utility customers in the State of Pennsylvania.

Q. Was all of such backfeed energy received by Penn Water from Maryland and referred to by Mr. Roland at pages 935 to 941, and which may have been used in connection with services to the Pennsylvania customers of Penn Water or Penn Water and Safe Harbor, used by such customers in public service? A. No, it was not, because a part of such energy was consumed in the transmission from Maryland to Safe Harbor and from Safe Harbor to these customers and a portion was consumed within the power systems of these customers as transmission and system losses.

Q. Was such backfeed energy from Maryland and the District of Columbia delivered to Penn Water continuously at all times throughout the year? A. No.

Q. When is such backfeed energy received by Penn Water and transmitted from Maryland to Pennsylvania? A. Backfeed is transmitted from Maryland to Pennsylvania generally during the low flow months of the year, but

[16598] at other times of the year backfeed may also be received during the off-peak hours of the week.

Q. Is this backfeed energy used directly by Penn Water or Safe Harbor in supplying their Pennsylvania customers? A. No.

Q. What happens to this electric energy received by Penn Water in Maryland and transmitted to Pennsylvania as backfeed? A. Such electric energy is in all cases co-mingled with electric energy or other electric services generated or supplied at either the Safe Harbor or Holtwood Power Developments before being used in connection with either their firm power obligations or interchange transactions with their Pennsylvania customers.

Q. Do the deliveries of electric services, including electric energy, which were made to the Pennsylvania customers and to the Pennsylvania Railroad Company by Penn Water and Safe Harbor always include an amount of co-mingled backfeed energy received from Maryland? A. They do not.

Q. At page 947 of the record, Mr. Roland testified with respect to the operation of house units at Safe Harbor during low flow operation. Is it a fact that at all times there is a generator operating, providing capacity and producing energy or reactive kva. at Safe Harbor? [16599] A. That is a fact.

Q. Is it a fact that at all times there is a generator operating and producing energy or reactive kva. at Holtwood? A. Except for a total of 135 hours in the last three years (1944-1945-1946) and then only on Sundays, there was a generator operating and producing energy or reactive kva. at Holtwood, and for each of those 135 hours there were frequency converters operating in the Holtwood plant supplying reactive, voltage regulation and other electric services.

Q. If at all times there is a generator operating at Safe Harbor, is it a fact that, as testified to, for example, by Mr. Roland at page 955, beginning at line 13, all of the energy

supplied to the Pennsylvania Power & Light Company at Donegal and Lehman Farm and to the Holtwood bus via Lehman Farm comes from Maryland? A. No. At all times such energy supplied at Donegal and Lehman Farm and to the Holtwood bus is energy transmitted from the Safe Harbor plant at 66 kv. and at times such energy is co-mingled with energy that might be from Maryland. At no time does all of the energy supplied at those points originate in Maryland without first being co-mingled with other electric services, including capacity, energy or reactive kva. originating at Safe Harbor.

Q. Have you prepared a tabulation showing the amounts of energy supplied by Penn Water, or Penn Water and Safe Harbor [16600] to their Pennsylvania firm customers (other than the Pennsylvania Railroad) for the years of 1944, 1945 and 1946, for those hours when there was no net backfeed from Baltimore Company received by Penn Water and transmitted from Maryland to Pennsylvania, and also for those hours when there was net backfeed received by Penn Water from Baltimore Company? A. I have.

MR. SPARKS: I would like to have this document marked for identification, Mr. Examiner.

TRIAL EXAMINER: It may be marked as Exhibit Number 356 for identification.

(The document referred to was marked for Identification as Exhibit Number 356.)

By MR. SPARKS:

Q. Will you please explain this exhibit? A. Exhibit 356 shows the total kilowatt hours supplied to the Pennsylvania firm customers in each of the three years, divided into the kwh. supplied during those hours when there was no net Baltimore backfeed and that supplied during those hours when there was such backfeed. The percentage that each is of the total energy deliveries is also shown. Also shown on Exhibit 356 are the total revenues received for

all firm electric services to these Pennsylvania customers, segregated to show the revenues billed and received for energy services [16601] alone during hours of Baltimore backfeed.

Q. Have you prepared a tabulation showing the kilowatt hours received by Penn Water in Maryland and transmitted to Pennsylvania during the years 1944, 1945 and 1946 that were used in connection with supply to Penn Water's, or Penn Water and Safe Harbor's Pennsylvania firm customers other than the Pennsylvania Railroad?
A. I have.

MR. SPARKS: Mr. Examiner, I would like to have this document marked for identification.

TRIAL EXAMINER: It may be marked as Exhibit Number 357 for identification.

(The document referred to was marked for Identification as Exhibit Number 357.)

By MR. SPARKS:

Q. Will you please explain this Exhibit? A. Exhibit 357 shows in Column 1, the kilowatt hours of net Baltimore backfeed used in connection with electric services supplied to Penn Water's or Penn Water and Safe Harbor's firm power customers in Pennsylvania (excluding the Pennsylvania Railroad) for the years 1944, 1945 and 1946.

There is shown in Column 2 of this exhibit an amount of dollars received from these customers for an amount of energy equal to the amounts shown in Column 1. These dollars were computed by using the average energy rates actually billed to [16602] these customers.

Column 3 shows, as a percentage, that portion of the kilowatt hours of net Baltimore backfeed used in connection with electric services for firm supply, shown in Column 1, in relation to the total firm kilowatt hours supplied to the Pennsylvania customers.

Column 4 shows, as a percentage, the dollars computed and shown in Column 2 in relation to the total revenues received from these Pennsylvania customers for all firm power services under their respective contracts.

Q. Have you prepared a tabulation showing the amounts of interchange energy supplied to the Pennsylvania customers during those hours when there was no net Baltimore backfeed received by Penn Water from Maryland, and also during the hours when there was such backfeed received by Penn Water and transmitted from Maryland to Pennsylvania? A. I have.

MR. SPARKS: Mr. Examiner, I would like to have this document marked for identification.

TRIAL EXAMINER: It may be marked as Exhibit Number 358 for identification.

(The document referred to was marked for Identification as Exhibit Number 358.)

By MR. SPARKS:

Q. Will you please explain this exhibit? [16603]

A. Exhibit 358 is a tabulation showing for the years 1944, 1945 and 1946 the amounts of interchange energy supplied to the Pennsylvania interchange customers during hours of no net Baltimore backfeed and also during those hours when there was such backfeed received by Penn Water and transmitted from Maryland to Pennsylvania. There is also shown the percentage each of these is of the total interchange services supplied.

Also shown on this Exhibit 358 are the total revenues received for all interchange services to these customers segregated into the revenues received for the energies supplied during such hours and the percentage each of these is of the total interchange revenues received.

Q. Have you prepared a tabulation showing the kilowatt hours of net Baltimore backfeed transmitted from Maryland to Pennsylvania by Penn Water and used in

connection with the supply of interchange services to these Pennsylvania customers? A. I have.

MR. SPARKS: I would like to have this document marked for identification.

TRIAL EXAMINER: It may be marked as Exhibit Number 359 for identification.

(The document referred to was marked for Identification as Exhibit Number 359.)

By MR. SPARKS:

Q. Will you please explain this exhibit? [16604]

A. Exhibit 359 shows in Column 1, the kilowatt hours of net Baltimore backfeed used by Penn Water and by Penn Water and Safe Harbor in connection with the supply of interchange services to their Pennsylvania customers during the years 1944, 1945 and 1946. There is shown in Column 2 of this exhibit an amount of dollars received from these customers for an amount of energy equal to the amounts shown in Column 1. These dollars were computed by applying the average hourly rates used in connection with the interchange billing to these customers during such periods.

Column 3 shows, as a percentage, that portion of the kilowatt hours of net Baltimore backfeed used in connection with interchange services supplied, shown in Column 1, in relation to the total interchange kilowatt hours supplied to the Pennsylvania customers.

Column 4 shows, as a percentage, the dollars shown in Column 2 in relation to the total revenues for interchange services received from these Pennsylvania customers.

Q. Was the year 1946 a typical or normal year as respects the amount of interchange transactions? A. No.

Q. What was the nature of such abnormalities? A. During the year 1946 the utility companies in Eastern Pennsylvania experienced material growth in load. To meet such requirements and still complete required [16605] maintenance of equipment, much of which had been

deferred during the war period, they arranged with us, under existing contracts, for an unusually large amount of interchange services which is reflected in the data shown on Exhibits 358 and 359 for the year 1946.

Q. Were the 1944 operating conditions as respects the amount of backfeed received from Maryland representative of the operating conditions in 1945 and 1946 or for average river flow conditions? A. They were not. River flow conditions experienced during the year 1944 were substantially lower than average and the amount of backfeed energy received was greater than normal due in part to low river flows and in part to war conditions.

Q. Beginning at page 979, Mr. Roland testified concerning the ownership of facilities for the transmission of electric energy which is transmitted from one or more states and consumed at points outside thereof, the amounts of electric energy so transmitted, and the sale of such electric energy for resale.

Does Penn Water own and operate facilities for the transmission of electric energy which is not transmitted from one or more states and consumed at points outside thereof? A. Yes, they do.

Q. What are some of these facilities? [16606]

A. With the exception of the 220 kv. transmission system extending from Safe Harbor to Baltimore and Washington and the 66 kv. transmission system extending from Holtwood to Baltimore and a portion of the 132 kv. transmission system extending from Safe Harbor to Perryville for the supply of electric service to the Pennsylvania Railroad, all of the facilities of Penn Water and Safe Harbor are used either in whole or in large part for the generation or transmission of electric energy which is not transmitted from a state but which is consumed at points within the state where such energy and other electric services are generated.

Q. Are the amounts of electric energy generated at either the Safe Harbor or Holtwood plants and consumed

in Pennsylvania substantial in amount? A. Yes, they are substantial both in amount and in proportion to the total amounts so generated and in proportion to the amounts so transmitted.

Q. Can you state what proportion of the total amounts of energy generated at Holtwood and Safe Harbor is consumed within the state of Pennsylvania and which was not transmitted from one or more states and consumed at points outside thereof? A. Such proportion of the total amounts of energy generated at Safe Harbor and at Holtwood for the year 1945 was at least 44 per cent and for the year 1946 was at least [16607] 51 per cent.

Q. Beginning at line 18 of page 979 of the record, Mr. Roland attempted to use the amounts of energy transmitted to the city of Coatesville, Pennsylvania, during the year 1944 as evidence of the substantial amount of energy transmitted from a state and consumed at points outside thereof. Was the total amount of 152,292,000 kilowatt hours in fact all transmitted from a state and consumed at points outside thereof? A. Absolutely not. Mr. Roland used the total requirements of the Philadelphia Electric Company in its Coatesville Division on page 979. Only a very small percentage, if any, of such energy was in fact transmitted from a state and consumed at a point outside thereof.

Mr. Roland, in Exhibit 42, claimed to have found that during his twenty hand-picked days there were only 59 per cent of the hours when he could find that there was any co-mingling of backfeed electric services available at Holtwood for delivery to the customers supplied from Holtwood, including Philadelphia Electric Company's Coatesville Division, but during such hours there was only supplied 13 per cent of the energy during such twenty days. Mr. Roland's assumption was that if a single kilowatt hour of backfeed was received at Safe Harbor, regardless of the amount of energy generated by or available to Safe Harbor from sources within the state, [16608] then all of the energy supplied by Safe Harbor, both backfeed and

that produced within the State of Pennsylvania, was interstate energy (or became interstate energy).

He then went on to assume that because some of the energy sent out from Safe Harbor was energy contaminated with backfeed and a single kilowatt hour of such energy was received at Holtwood as 60 cycle, then all of the energy sent out from Holtwood at 60 cycle was interstate energy. It was only on this assumption that he could find any such number of hours in his hand-picked twenty days that showed any backfeed energy that could possibly have been used in connection with the supply to Coatesville.

After studying Exhibit 42, it is my opinion that a very small percentage of any backfeed energy was actually used in connection with the supply of the electric services to the Philadelphia Electric Company at Coatesville and in any such use it was largely submerged in the electric services supplied from the Holtwood and Safe Harbor developments themselves. In this explanation I want to be sure it is understood that I do not agree with the assumption used by Mr. Roland in his preparation of Exhibit 42, nor in his conclusions drawn therefrom.

Q. Do Penn Water and S.T.Co. operate facilities which are used in local distribution? A. Yes, they do.

[16609] Q. Please describe such facilities? A. Facilities at Holtwood used in connection with the supply of electric services to the Pioneer Electric Division of the Pennsylvania Power & Light Company and also certain facilities at Highlandtown Substation in Baltimore are distribution facilities.

Q. Do Penn Water and S.T.Co. own and operate facilities used only for the transmission of electric energy not transmitted from a state and consumed at any point outside thereof? A. They do.

Q. Please describe such facilities? A. The 110 kv. transmission line extending from Philadelphia Road Substation in Baltimore to the Gunpowder Substation in Maryland is a transmission facility used exclusively by Balti-

more Company as a part of that Company's transmission network supplying the area contiguous to Baltimore City and which load area does not extend outside of the State of Maryland.

Q. In Exhibit 42 and the testimony supporting that exhibit, Mr. Roland testified as to the flow of energy to the York, Pennsylvania area. Beginning at page 8797, Mr. Roland was questioned in that connection with respect to the flow of energy under the new Metropolitan Edison contract, identified as Exhibit 72.

Is it a fact that under the new M.E. contract, Exhibit 72, the flow of energy to the York area for firm power purposes [16610] is materially different, both in quantity and time, as compared with the flow of energy under the superseded Edison Light and Power Company contract, identified in these proceedings as Exhibit 71? A. It is quite different.

Q. What are the major differences as respects energy flow? A. Under the superseded Exhibit 71, Penn Water and Safe Harbor had an operating responsibility for 40 per cent of the electric service requirements, including energy of the Edison Light and Power Company at all times during the day and week. To fulfill these obligations, definite amounts of electric services were supplied to the York area, not only during the peak periods of the week, but also during all other hours including Saturday and Sunday.

Under the present Metropolitan Edison Company Contract, Exhibit 72, the operating responsibilities of Penn Water were limited to two conditions. The first, to supply all of the electric service requirements of M. E. Co. above its steam line. No electric services are required to meet this condition except during the peak hours of the week and during such hours Penn Water and Safe Harbor are always operating substantial amounts of hydro capacity in addition to the Holtwood steam capacity.

The second provides that Penn Water shall supply a [16611] specified amount of electric services below the M.E. steam line, but only when the actual generation at Holtwood and Safe Harbor exceeds 50,000 kw. The obligation for such supply is less than ten per cent of such generation.

Therefore, Penn Water's obligation for services to Metropolitan Edison Company is, from a practical operating viewpoint, limited to those hours when there are substantial amounts of generation at Holtwood and Safe Harbor.

Q. Is it a fact that under the contract, Exhibit 72, no supplemental electric services from other sources are required by Penn Water to meet its firm power obligations to Metropolitan Edison Company? A. That is a fact. Penn Water requires no supplemental services either from its Pennsylvania customers or Baltimore Company to meet its firm power obligations to Metropolitan Edison Company.

Q. Is it a fact that under contract, Exhibit 72, that no backfeed energy generated in Maryland is used to supply Penn Water's firm power obligations to Metropolitan Edison Company? A. That is a fact. However, I found one hour in 1946 when any backfeed energy from Baltimore might be said to have been so used and that was during a period when one of the Holtwood 60 cycle hydro units was out for maintenance.

Q. As a result of the contract changes and the operations [16612] resulting therefrom with respect to the delivery of firm power energy in the York area, do the results in the year 1944 have any relation to the actual facts as they exist today? A. They are not.

Q. Beginning at line 17 of page 8834 of the record, Mr. Roland testified that you advised him that the sales to the Pennsylvania Railroad in the State of Maryland are the obligations of Baltimore Company and the sales in the State of Pennsylvania are the obligations of Penn Water.

Did you so advise Mr. Roland? A. I did not.

I was very specific in discussing these transactions with the Pennsylvania Railroad to point out that only one bill was rendered to the Railroad by Baltimore Company and that for the purposes of computing the division of the revenues as between Penn Water and Baltimore in accord with an Operating Committee Memorandum, which has subsequently been identified as Exhibit 11, the deliveries to the Pennsylvania Railroad in Pennsylvania "were considered as deliveries by Penn Water" and that deliveries to the Railroad in Maryland were, for such purpose, "considered as deliveries by Baltimore."

At no time in my discussions with Mr. Roland did I refer to the obligations or operating responsibilities of the respective parties to the Pennsylvania Railroad contract.

[16613] Q. At the bottom of page 8837 of the record Mr. Roland testified that Baltimore Company supplied part of the power requirements of the Pennsylvania Railroad in Pennsylvania. Does Baltimore Company in fact supply any of the Railroad's power requirements in Pennsylvania?

A. Baltimore Company does not directly supply any of the requirements of the Pennsylvania Railroad. Baltimore Company has no facilities for so doing. All electric services supplied to the Pennsylvania Railroad are in fact supplied through the facilities of Safe Harbor and Penn Water in Pennsylvania and Maryland, and through the facilities of Potomac Electric Power Company in Washington. Baltimore Company has a joint operating responsibility for all of the electric services supplied to the Railroad.

Actually, of the electric services supplied by Baltimore Company to the Potomac Electric Power Company and by that Company to the Railroad at Benning, only a very small amount, perhaps of the order of one per cent of such supply, can be traced over the Railroad's own facilities from Maryland into Pennsylvania, but such transmission is carried out by the Railroad for its own purposes.

As to the supply to the Pennsylvania Railroad at Conestoga Substation and from the Perryville line, such serv-

ices are supplied to the Railroad through the facilities of Penn Water. A large part of such electric services may from time [16614] to time be co-mingled with energy originating in Maryland from Baltimore Company.

Q. Beginning at line 13 of page 8845 of the record, Mr. Roland testified that for billing purposes that portion of the energy sold in Maryland is considered a sale by Baltimore and the billing and the split-up of the money paid by the Railroad is paid accordingly.

Is it a fact that for billing purposes to the Pennsylvania Railroad, under the power contract identified as Exhibit 10, that portion of the services sold in Maryland is considered as sold by Baltimore Company? A. No, that is not correct.

Q. Will you please state the facts? A. The billing to the Pennsylvania Railroad for the services rendered under the contract identified as Exhibit 10 is prepared jointly by Penn Water, Safe Harbor and Baltimore Company, largely from the records of Penn Water and Safe Harbor. The necessary billing records are transmitted by Penn Water to Baltimore Company and such bill is rendered by Baltimore Company to the Pennsylvania Railroad.

In the computation of this bill there are no records included, nor is the Pennsylvania Railroad interested in the portion of the services delivered to the Railroad in the states of Pennsylvania and Maryland, respectively, nor is the Railroad concerned how the amounts of such revenues [16615] received by Baltimore Company are split up between the parties to the contract. However, in connection with the intercompany billing as between Baltimore Company and Penn Water, Penn Water does advise Baltimore Company as to the amounts of energy delivered to the Railroad in Pennsylvania and Maryland, respectively, in order that a division of such Pennsylvania Railroad revenues may be made. In the determination of this division, an arbitrary method had been agreed upon by the

parties in accordance with the provisions of Exhibit 11 of this record.

Q. Beginning at page 8894, Mr. Roland testified concerning his understanding of the difference between the gross meter readings of energy in connection with interchange transactions and the billing figures for energy in connection with interchange transactions between Philadelphia Electric Company and Penn Water at Perryville and Thorndale.

Will you please describe the difference between gross meter reading figures and billing figures in that connection? A. When two electric utilities each have power generating facilities which are operated in parallel and which are used to interchange energy, capacity, reactive power, etc., in varying amounts through different hours of the day or the week, meters are provided to measure and integrate such interchange transactions. Due to the inability of operating personnel to regulate the flow of power and energy between [16616] the systems as their respective loads may vary, power and energy may flow in one direction and then in the opposite direction during a portion of such hours. It is customary to provide, and in the present instance there are provided at both Perryville and Thorndale, ratcheted KWH meters and RVAH meters with associated printometers to record the hourly integrations of the several ratcheted meters which record the gross flow in each direction for each clock-hour. The printometers provide a record of gross transfers in each direction for each hour.

When two systems are interconnected by more than one transmission path as is the case between Penn Water and Philadelphia Electric over the Railroad facilities via Thorndale and via Perryville, not only may there be a reversal of flow at each interchange point during an hour, but there may unintentionally be flow in one direction through Perryville with a reversal of flow at Thorndale. The net of such hourly integration at Perryville and Thorn-

dale, respectively, is the effective energy transferred between the systems in any hour.

It is obvious then that the net hourly interchange at two points is the only record of interest for any billing period. It is impracticable to consider operating costs for a billing period less than a clock-hour and, therefore, the net hourly integration at Perryville and Thorndale in any [16617] clock-hour is the basis for interchange accounting between Penn Water and Philadelphia Electric.

[16618] Q. Beginning at line 14 of page 9063, Mr. Roland testified that he was interested in knowing what kind of deliveries were being made at the various points and among other things whether the energy so delivered was paid for. In determining the kind of deliveries being made, is it necessary to know whether or not the deliveries are on a net or gross meter reading basis? A. It is.

Q. In determining whether the energy delivered was paid for, is it necessary to know whether the billing basis was upon a net or gross meter reading? A. It is.

Q. Why do you say that it is necessary to know the character of the meter readings, in order to determine the kind of delivery and whether such energy delivered was paid for? A. The billing and payments for energy and other services specified in the contract are determined by the [16619] services themselves as specified in the contract. Obviously, if charges, rates or payments specified in a contract are based upon a net meter reading basis, rather than a gross meter reading basis, the amount of charges calculated on each of those bases would be different. In all instances, the net meter reading basis is used for interchange accounting and billing purposes for the reasons just described.

Q. Beginning at page 9066 of the record, Mr. Roland was questioned concerning the circulation of energy from or between the Westport and Riverside Substations at Bal-

timore via the 220 kv. transmission system between Baltimore and Safe Harbor.

Is it a fact that at times these 220 kv. transmission lines are used for the transfer of energy between that portion of Baltimore Company's system near Riverside and that portion of its system near Westport? A. Frequently. That is one of the recognized uses of the 220 kv. transmission line. It frequently happens that the generation at Riverside is in excess of the local requirements of Baltimore Company in the Riverside area and such excess flows from Riverside to Safe Harbor and back from Safe Harbor to Westport and to Takoma Park. Such a 220 kv. loop being in parallel with Baltimore Company's 110 kv. ring circuit and also in parallel with that Company's 33 kv. cable system connecting Riverside and Westport, the proportions of [16620] power and reactive flows in each parallel circuit will depend largely on the electrical characteristics of each path.

Q. What was the principal purpose of providing the Riverside line in addition to the Westport-Safe Harbor circuit between Safe Harbor and Baltimore? A. It was originally contemplated that two high voltage lines would be required between Safe Harbor and Baltimore, not for their circuit capacity but to provide reliability, including electrical stability in the event of trip-outs on one line due to lightning or other electrical phenomena, and the Baltimore system depended on a large amount of capacity from Safe Harbor both then and now.

This second circuit to Riverside, initially planned for operation in 1932, was delayed until 1937 largely due to depression conditions.

Q. Were there any special circumstances which culminated in a decision to provide the second circuit in 1937? [16621] A. Yes, there were. Baltimore had just made a contract providing for a large supply of 60-cycle power to the Sparrows Point plant of the Bethlehem Steel Company in the Riverside area. Baltimore at first contemplated